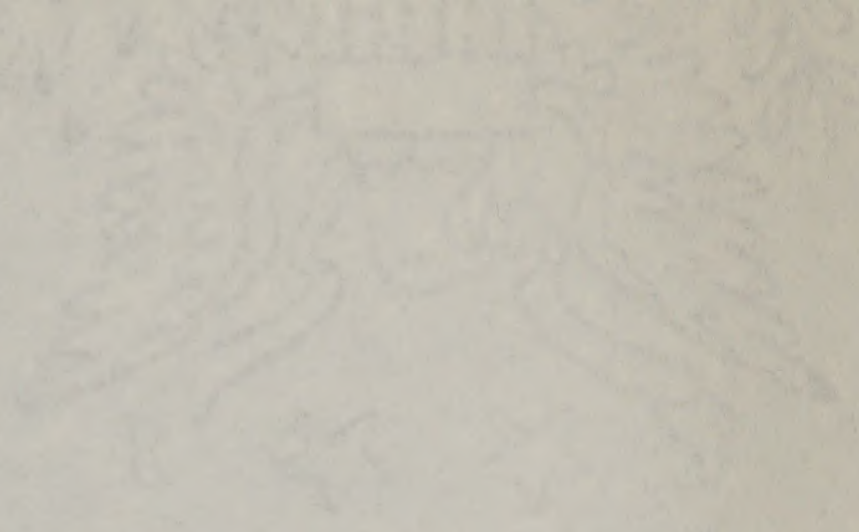


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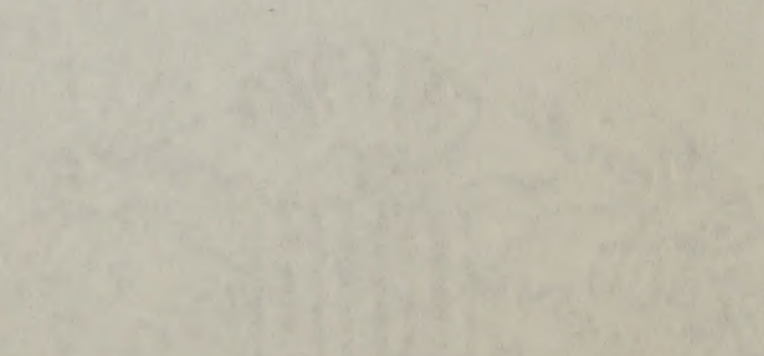


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I have been thinking of you very much lately
and wondering how you are getting on.
I hope you are well and happy.
I have been very busy lately
but I will write to you again soon.
I am sure you will be glad to hear from me.
I am sure you will be glad to hear from me.
I am sure you will be glad to hear from me.

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1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

2. The second part of the document is a report from the Secretary of the Treasury, dated January 1, 1861. It is a very important document, as it contains the Secretary's report to the Congress on the state of the Treasury at the beginning of his first term. The report is written in a formal, dignified style, and it is one of the most important documents in American history.

3. The third part of the document is a report from the Secretary of the Interior, dated January 1, 1861. It is a very important document, as it contains the Secretary's report to the Congress on the state of the Interior at the beginning of his first term. The report is written in a formal, dignified style, and it is one of the most important documents in American history.

4. The fourth part of the document is a report from the Secretary of the War, dated January 1, 1861. It is a very important document, as it contains the Secretary's report to the Congress on the state of the War at the beginning of his first term. The report is written in a formal, dignified style, and it is one of the most important documents in American history.

5. The fifth part of the document is a report from the Secretary of the Navy, dated January 1, 1861. It is a very important document, as it contains the Secretary's report to the Congress on the state of the Navy at the beginning of his first term. The report is written in a formal, dignified style, and it is one of the most important documents in American history.

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BLISTER RUST CONTROL IN 1934 BY PROJECTS
Southern Appalachian Region

Initial Work and Subsequent Workings, Excluding Nursery Sanitation.

State	A C R E A G: E W O R K E D								
	P. W. A.			E. C. W.			Both E. C. W. and P. W. A.		
	Total	Initial	Rework	Total	Initial	Rework	Total	Initial	Rework
Georgia	126,720	126,720	0	6,642	6,642	0	133,362	133,362	0
Kentucky	61,523	61,523	0	0	0	0	61,523	61,523	0
Maryland	106,904	106,435	469	260	260	0	107,164	106,695	469
North Carolina	558,012	558,012	0	24,598	24,598	0	582,610	582,610	0
South "	29,828	28,828	1,000	0	0	0	29,828	28,828	1,000
Tennessee	89,538	89,538	0	12,050	12,050	0	101,588	101,588	0
Virginia	92,584	92,584	0	16,042	12,373	3,669	108,626	104,957	3,669
West Virginia	30,831	28,883	1,948	2,353	1,819	534	33,184	30,702	2,482
Total	1,095,940	1,092,523	3,417	61,945	57,742	4,203	1,157,885	1,150,265	7,620

State	P I N E A R E A P R O T E C T E D								
	P. W. A.			E. C. W.			Both E. C. W. and P. W. A.		
	Total	Initial	Rework	Total	Initial	Rework	Total	Initial	Rework
Georgia	42,240	42,240	0	2,214	2,214	0	44,454	44,454	0
Kentucky	26,372	26,372	0	0	0	0	26,372	26,372	0
Maryland	31,424	31,380	44	20	20	0	31,444	31,400	44
North Carolina	158,520	158,520	0	8,801	8,801	0	167,321	167,321	0
South "	16,917	16,029	888	0	0	0	16,917	16,029	888
Tennessee	22,567	22,567	0	5,936	5,936	0	28,503	28,503	0
Virginia	17,770	17,770	0	5,153	4,144	1,009	22,923	21,914	1,009
West Virginia	5,228	5,040	188	472	312	160	5,700	5,352	348
Total	321,038	319,918	1,120	22,596	21,427	1,169	343,634	341,345	2,289

R I B E S R E M O V E D, B O T H W I L D A N D C U L T I V A T E D									
Georgia	12,509	12,509	0	235	235	0	12,744	12,744	0
Kentucky	3,925	3,925	0	0	0	0	3,925	3,925	0
Maryland	890,086	852,200	37,886	76,051	76,051	0	966,137	928,251	37,886
North Carolina	100,053	100,053	0	269	269	0	100,322	100,322	0
South "	2,213	2,183	30	0	0	0	2,213	2,183	30
Tennessee	50,686	50,686	0	14,610	14,610	0	65,296	65,296	0
Virginia	422,399	422,399	0	646,276	607,200	39,076	1,068,675	1,029,599	39,076
West Virginia	113,522	107,673	5,849	21,543	14,805	6,738	135,065	122,478	12,587
Total	1,595,393	1,551,628	43,765	758,984	713,170	45,814	2,354,377	2,264,798	89,579

BLISTER RUST CONTROL IN 1934 BY PROJECTS
Southern Appalachian Region
 Initial Work and Subsequent Workings Excluding Nursery Sanitation

State	¹ Total	P Initial	W Initial	A Initial	L Rework	A Total	B Total	O Initial	R Initial	- Initial	E Rework	C Total	M Total	A Total	N Initial	D Total	A Initial	Y Initial	S Initial	Both Initial	E.C.W. and Initial	P.W.A. Rework
Georgia	172		172		0	0	0			0			0			172		172				0
Kentucky	629		629		0	0	0			0			0			629		629				0
Maryland	1,901		1,850		51	292	292			0			0			2,193		2,142				51
North Carolina	1,487		1,487		0	117	117			0			0			1,604		1,604				0
South Carolina	278		278		0	0	0			0			0			278		278				0
Tennessee	43		43		0	191	191			0			0			234		234				0
Virginia	3,194		3,194		0	6,311	5,759			552			552			9,505		8,953				552
West Virginia	503		436		67	572	316			256			256			1,075		752				323
Total	8,207		8,089		118	7,483	6,675			808			808			15,690		14,764				926

SUPERVISION MAN DAYS (Including State Leaders only S. Car. and Georgia)

Georgia	285	285	0	11	11	0	296	296	0
Kentucky	208	208	0	0	0	0	208	208	0
Maryland	305	300	5	0	0	0	305	300	5
North Carolina	1,176	1,176	0	38	38	0	1,214	1,214	0
South Carolina	135	125	10	0	0	0	135	125	10
Tennessee	890	890	0	106	106	0	996	996	0
Virginia	938	938	0	1,441	1,417	24	2,379	2,355	24
West Virginia	771	753	18	62	42	20	833	795	38
Total	4,708	4,675	33	1,658	1,614	44	6,366	6,289	77

TOTAL MAN-DAYS² (Including labor and supervision including state leaders only
in Georgia and South Carolina)

Georgia	457	457	0	11	11	0	468	468	0
Kentucky	837	837	0	0	0	0	837	837	0
Maryland	2,206	2,150	56	292	292	0	2,498	2,442	56
North Carolina	2,663	2,663	0	155	155	0	2,818	2,818	0
South Carolina	413	403	10	0	0	0	413	403	10
Tennessee	933	933	0	297	297	0	1,230	1,230	0
Virginia	4,132	4,132	0	7,752	7,176	576	11,884	11,308	576
West Virginia	1,274	1,189	85	634	358	276	1,908	1,547	361
Total	12,915	12,764	151	9,141	8,289	852	22,056	21,053	1,003

¹These figures were taken from Washington payroll records and may not agree with records found in State report.

²The number of supervision man days was calculated by counting the actual days worked excluding Sundays, holidays and half days on Saturdays, from the beginning of the period to the end of the eradication season. For Georgia, Maryland, Tennessee, Virginia, & West Virginia the season closed October 31; for Kentucky and North Carolina, November 30; for South Carolina, December 31. These figures may therefore not always agree with State reports.

Table 1

Group 1		Group 2		Group 3	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102

Table 2

Group 1		Group 2		Group 3	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102

Table 3

Group 1		Group 2		Group 3	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102

This document contains three tables of data. The first table, Table 1, shows data for 102 items. The second table, Table 2, shows data for 102 items. The third table, Table 3, shows data for 102 items. The data is organized into three groups, each with 102 items. The data is presented in a clear and concise manner, making it easy to read and understand.

BLISTER RUST CONTROL IN 1934 BY PROJECTS
Southern Appalachian Region

SHEET C

Initial Work and Subsequent Workings, Excluding Nursery Sanitation

State	Cost Data for Blister Rust Control (Includes Labor, Agents and Scouts, State Leaders in Ga. & S.Car. & Equipment and Supplies)								
	P. W. A.			E. C. W.			Combined P.W.A. and E.C.W.		
	Total	Initial	Rework	Total	Initial	Rework	Total	Initial	Rework
Georgia	\$3,788.36	\$3,788.36	\$ 0	\$ 119.01	\$ 119.01	\$ 0	\$3,907.37	\$3,907.37	\$ 0
Kentucky	4,345.24	4,345.24	0	0	0	0	4,345.24	4,345.24	0
Maryland	8,131.78	7,927.05	204.73	292.00	292.00	0	8,423.78	8,219.05	204.73
North Carolina	14,537.24	14,537.24	0	786.20	786.20	0	15,323.44	15,323.44	0
South "	3,140.07	3,099.57	40.50	0	0	0	3,140.07	3,099.57	40.50
Tennessee	6,251.73	6,251.73	0	720.09	720.09	0	6,971.82	6,971.82	0
Virginia	19,128.29	19,128.29	0	11,632.64	10,856.06	776.58	30,760.93	29,984.35	776.58
West Virginia	6,548.60	6,238.45	310.15	1,027.01	851.41	175.60	7,575.61	7,089.86	485.75
Total	65,871.31	65,315.93	555.38	14,576.95	13,624.77	952.18	80,448.26	78,940.70	1,507.56

BLISTER RUST CONTROL WORK IN SOUTHERN APPALACHIAN STATES UP TO AND INCLUDING 1934, EXCLUDING NURSERY SANITATION
(Including all programs, Regular, P.W.A. and E.C.W.)

SHEET D

	I N I T I A L W O R K														
	1928 to 1933 Inclusive					1934					1928 to 1934 Inclusive				
	Acres worked	No. Ribes removed	Cost	Per Acre Cost	Ribes	Acres worked	No. Ribes removed	Cost	Per Acre Cost	Ribes	Acres worked	No. Ribes removed	Cost	Per Acre Cost	Ribes
Delaware	8	0	\$ 3.50	\$ 0.437	0	0	0	0	0	0	8	0	\$ 3.50	\$ 0.437	0
Georgia	8,851	0	162.65	0.184	0	133,362	12,744	\$3,907.37	.029	0.09	142,213	12,744	4,070.02	0.029	0.09
Kentucky	0	0	00	0.00	0	61,523	3,925	4,345.24	.071	0.06	61,523	3,925	4,345.24	0.071	0.06
Maryland	2,690	187,471	1,711.30	0.632	60.9	106,695	928,251	8,219.05	.077	8.70	109,385	1,115,722	9,930.35	0.091	10.19
North Carolina	29,570	360	1,828.48	0.062	0.012	582,610	100,322	15,323.44	.263	0.17	612,180	100,682	17,152.72	0.280	0.16
South Carolina	888	0	43.04	0.048	0	28,828	2,183	3,099.57	.107	0.07	29,716	2,183	3,142.61	0.106	0.07
Tennessee	10,720	62,872	1,048.83	0.098	5.8	101,588	65,296	6,971.82	.069	0.64	112,308	128,168	8,020.65	0.071	1.14
Virginia	26,253	283,039	9,495.70	0.362	10.8	104,957	1,029,599	29,984.35	.286	9.81	131,210	1,312,638	39,480.05	0.301	10.00
West Virginia	4,524	60,750	1,357.10	0.300	13.4	30,702	122,478	7,089.86	.231	3.99	35,226	183,228	8,446.96	0.240	5.20
Total	83,504	594,492	15,650.60	0.187	7.1	1,150,265	2,264,798	78,940.70	.069	1.97	1,233,769	2,859,290	94,592.10	0.077	2.32
R E E R A D I C A T I O N															
Maryland	0	0	0	0	0	469	37,886	204.73	.436	80.78	469	37,886	204.73	0.436	80.78
South Carolina	0	0	0	0	0	1,000	30	40.50	.040	0.03	1,000	30	40.50	0.040	0.03
Virginia	3,550	28,866	386.05	0.109	8.1	3,669	39,076	776.58	.211	10.65	7,219	67,942	1,162.63	0.161	9.41
West Virginia	0	0	0	0.000	0	2,482	12,587	485.75	.196	5.07	2,482	12,587	485.75	0.196	5.07
Total	3,550	28,866	386.05	0.109	8.1	7,620	89,579	1,507.56	.198	11.75	11,170	118,445	1,893.61	0.170	10.60
C o m b i n e d I N I T I A L A N D R E E R A D I C A T I V E W O R K															
Delaware	8	0	3.50	0.437	0	0	0	0	0	0	8	0	3.50	0.437	0
Georgia	8,851	0	162.65	0.184	0	133,362	12,744	3,907.37	.029	0.09	142,213	12,744	4,070.02	0.029	0.09
Kentucky	0	0	0	0.00	0	61,523	3,925	4,345.24	.071	0.06	61,523	3,925	4,345.24	0.071	0.06
Maryland	2,690	187,471	1,711.30	0.632	60.9	107,164	966,137	8,423.78	.079	9.02	109,854	1,153,608	10,135.08	0.092	10.50
North Carolina	29,570	360	1,828.48	0.062	0.012	582,610	100,322	15,323.44	.263	0.17	612,180	100,682	17,151.92	0.280	0.16
South Carolina	888	0	43.04	0.048	0	29,828	2,213	3,140.07	.105	0.07	30,716	2,213	3,183.11	0.104	0.07
Tennessee	10,720	62,872	1,048.83	0.098	5.8	101,588	65,296	6,971.82	.069	0.64	112,308	128,168	8,020.65	0.071	1.14
Virginia	29,803	311,905	9,881.75	0.331	10.4	108,626	1,068,675	30,760.93	.283	9.84	138,429	1,380,580	40,642.68	0.294	9.97
West Virginia	4,524	60,750	1,357.10	0.300	13.4	33,184	135,065	7,575.61	.228	4.07	37,708	195,815	8,932.71	0.237	5.19
Total	87,054	623,358	16,036.65	0.184	7.1	1,157,885	2,354,377	80,448.26	.069	2.03	1,244,939	2,977,735	96,484.91	0.078	2.39

BLISTER RUST CONTROL IN 1934 ACCORDING TO AGENCIES
Southern Appalachian Region

(Excluding Nursery Sanitation)

(Under Public Works Administration) P.W.A. ²

	Acreage in white pine	Acreage worked	Number Ribes Pulled			Labor ¹ man days	Scout or Agent man-days	Total man days	Acres worked per total man day	Number Ribes pulled per acre
			Wild bushes	Cultivated bushes	Total					
Georgia	42,240	126,720	0	12,509	12,509	172	285	457	277.3	0.09
Kentucky	26,372	61,523	2,095	1,830	3,925	629	208	837	73.7	0.06
Maryland	31,424	106,904	889,024	1,062	890,086	1,901	305	2,206	48.4	8.2
North Carolina	158,520	558,012	14,823	85,230	100,053	1,487	1,176	2,663	209.6	0.18
South Carolina	16,917	29,828	0	2,213	2,213	278	135	413	72.0	0.07
Tennessee	22,567	89,538	49,535	1,151	50,686	43	890	933	95.9	0.56
Virginia	17,770	92,584	408,474	13,925	422,399	3,194	938	4,132	22.4	4.6
West Virginia	5,228	30,831	110,136	3,386	113,522	503	771	1,274	24.2	3.7
Total	321,038	1,095,940	1,474,087	121,306	1,595,393	8,207	4,708	12,915	84.8	1.45

F E D E R A L E X P E N D I T U R E S

	Labor for eradication and scouting	Scouts and District agents	State Leaders in South Car. and Georgia	Supplies and equipment	Total Eradication ² cost including Ga. & S. Car. State Leaders	State Leaders other than Georgia and South Carolina	Grand total Eradication costs plus State Leaders supervision
Georgia ³	\$562.40	\$1,509.36	\$1,695.95	\$20.65	\$3,788.36	0	\$3,788.36
Kentucky ⁴	2,294.05	1,811.72	00	239.47	4,345.24	\$1,074.13	5,419.37
Maryland ³	6,908.45	1,035.89	00	187.44	8,131.78	1,800.50	9,932.28
North Carolina ⁴	5,128.27	9,230.09	00	178.88	14,537.24	1,415.80	15,953.04
South Carolina ⁵	1,000.35	0.00	2,080.88	58.84	3,140.07	00	3,140.07
Tennessee ³	156.40	6,035.62	00	59.71	6,251.73	1,451.25	7,702.98
Virginia ³	11,692.65	7,197.68	00	237.96	19,128.29	1,300.49	20,428.78
West Virginia ³	1,889.47	4,550.50	00	108.63	6,548.60	1,134.50	7,683.10
Totals	29,632.04	31,370.86	3,776.83	1,091.58	65,871.31	8,176.67	74,047.98

¹Labor man days not taken from State Leader's reports but from records of accounts paid to laborers, in Washington office.

²Includes state leaders in Georgia and South Carolina since the latter two were doing the same kind of work as district agent.

³Through October 31.

⁴Through November 30.

⁵Through December 31.

BLISTER RUST CONTROL IN 1934 ACCORDING TO AGENCIES
Southern Appalachian Region

(Excluding Nursery Sanitation)

Under E.C.W. Program

	Acreage in white pine	Acreage worked	Number Ribes pulled			No. C.C.C. man days	No. man days supervision by checker et al.	Total No. man days supervision plus labor	Acres worked per total man day	Number Ribes per acre ^x	Cost		No. of camps
			Wild bushes	Cultivated bushes	Total						Total	Per acre worked	
Georgia													
Cherokee & Nantahala Nat.For.	2,214	6,642	0	235	235	0	11	11	603.8	0.09	\$119.01	0.040	1
Kentucky													
			No E.C.W. work carried on in the state										
Maryland - Initial work	20	260	76,051	0	76,051	292	0	292	0.8	292.0	292.00	1.123	2
North Carolina, Pisgah Nat. For.	8,801	24,598	0	269	269	117	38	155	158.6	0.01	786.20	0.032	1
South Carolina													
			No E.C.W. work carried on in the state										
Tennessee - Initial work													
Cherokee National Forest	2,934	3,910	0	0	0	0	15	15	260.0	0.0	157.74	0.040	0
Unaka " "	2,922	8,060	81	104	185	120	91	211	38.3	0.02	475.70	0.0590	4
Johnson County work	72	72	9,941	0	9,941	48	0	48	1.5	138.07	56.96	0.791	1
Morgan " "	7.5	7.5	4,484	0	4,484	23	0	23	0.33	584.5	29.69	3.960	1
Total	5,936	12,050	14,506	104	14,610	191	106	297	40.2	1.21	720.09	0.059	6
Virginia ¹													
Initial work	4,144	12,373.3	607,200	0	607,200	5,759	1,417.2	7,176.2	1.7	49.0	10,856.06	0.877	10
Reeradication	1,009	3,669.2	39,076		39,076	552	23.8	575.8	6.4	10.6	776.58	0.21	3
Total	5,153	16,042.5	646,276	0	646,276	6,311	1,441.0	7,752.0	2.7	40.3	11,632.64	0.725	10
West Virginia - Initial work													
Watoga State Park	100	250	2,979	0	2,979	11	11	22	11.4	11.9	96.91	0.387	1
Geo. Wash. Forest	212	1,569	11,826	0	11,826	305	31	336	4.6	7.5	754.50	0.481	1
Total Initial work	312	1,819	14,805	0	14,805	316	42	358	5.0	8.1	851.41	0.473	2
Reeradication													
Watoga State Park	85	99	4,952	0	4,952	59	0	59	1.7	50.2	61.60	0.62	1
Geo. Wash. National For.	75	435	1,786	0	1,786	197	20	217	2.0	4.1	114.00	0.26	1
Total reworking	160	534	6,738	0	6,738	256	20	276	1.9	12.6	175.60	0.323	2
Total work in state	472	2,353	21,543	0	21,543	572	62	634	3.7	9.2	1,027.01	0.436	2
Grand totals	22,596	61,945	758,376	608	758,984	7,483	1,658	9,141	6.8	12.2	14,576.95	0.235	22 ²

¹For details as to National Forest, National Park, State land see Virginia Annual Report, Table 2 page 18.

²Some camps were used both for initial work and reworking.

SUMMARY OF CONTROL WORK FOR 1934 BY PROGRAMS
Southern Appalachian Region.

Sheet G

(Excluding Nursery Sanitation)

Program	Area Erad- icated of Ribes (acres)	No. Ribes destroyed	Cost of eradicating Ribes	No. of* man days	No. of acres per total man days	No. Ribes per acre	Cost per acre	Man days per acre
E. C.W.	61,945	758,984	\$14,576.95	9,141	6.8	12.2	0.235	0.148
P.W.A.	1,095,940	1,595,393	65,871.31	12,915	84.8	1.5	0.060	0.011
Totals	1,157,885	2,354,377	80,448.26	22,056	52.5	2.0	0.069	0.019

SUMMARY OF CONTROL FOR 1933

E. C. W.	74,462	379,511	13,558.08	4,369	17.0	5.1	0.18	0.059
P.W.A.	1,890	187,470	1,684.95	316	5.6	99.2	0.89	0.167
Regular	2,591	6,514	131.25	35	74.0	2.5	0.05	0.014
Totals	78,943	573,495	15,374.28	4,720	16.7	7.3	0.195	0.060

COMBINED DATA FOR 1933 AND 1934.

E. C. W.	136,407	1,138,495	28,135.03	13,510	10.096	8.3	0.205	0.099
P. W. A.	1,097,830	1,782,863	67,556.26	13,231	82,974	1.6	0.062	0.012
Regular	2,591	6,514	131.25	35	74,029	2.5	0.05	0.014
Totals	1,236,828	2,927,872	95,822.54	26,776	46,191	2.4	0.077	0.022

*This includes man days of laborers, scouts and district agents and state leaders of Georgia, and South Carolina who acted as district agents conducting scouting themselves.

BLISTER RUST CONTROL IN 1934 BY OWNERSHIP OF LANDS
Excluding Nursery Sanitation

SHEET H

Southern Appalachian Region.

State	A C R E A G E W O R K E D						N U M B E R O F R I B E S P U L L E D							
	Federal ownership			State owner-ship	Private owner-ship	Total	Federal Ownership			State owner-ship	Private owner-ship	Total	Wild bushes	Cultivated ²
	National forests	National Parks	Total				National Forests	National Parks	Total					
Georgia ¹	6,642	0	6,642	0	126,720	133,362	685	0	685	0	12,059	12,744	0	12,744
Kentucky ¹	0	0	0	0	61,523	61,523	0	0	0	0	3,925	3,925	2,095	1,830
Maryland	0	0	0	17,980	89,184	107,164	0	0	0	293,785	672,352	966,137	965,075	1,062
North Carolina	24,598	0	24,598	0	558,012	582,610	269	0	0	0	100,053	100,322	14,823	85,499
South Carolina	1,000	0	1,000	0	28,828	29,828	30	0	30	0	2,183	2,213	0	2,213
Tennessee	11,970	0	11,970	0	89,618	101,588	185	0	0	0	65,111	65,296	64,041	1,255
Virginia	7,148	6,949	14,097	0	94,529	108,626	26,027	605,224	631,251	0	437	1,068,675	1,054,750	13,925
West Virginia	2,004	0	2,004	349	30,831	33,184	13,612	0	13,612	7,931	113,522	135,065	131,679	3,386
Total	53,362	6,949	60,311	18,329	1,079,245	1,157,885	40,808	605,224	645,578	301,716	969,642	2,354,377	2,232,463	121,914

	M A N D A Y S S U P E R S I O N A N D L A B O R						C O S T O F C O N T R O L W O R K E X C L U D I N G S T A T E L E A D E R ' S S A L A R Y A N D E X P E N S E S E X C E P T I N S o u t h C a r o l i n a a n d G e o r g i a							
Georgia	11	0	11	0	457	468	\$119.01	0	\$119.01	0	\$3,788.36	\$3,907.37		
Kentucky	0	0	0	0	837	837	0	0	0	0	4,345.24	4,345.24		
Maryland	0	0	0	909	1,589	2,498	0	0	0	2,390.02	6,033.76	8,423.78		
North Carolina	155	0	155	0	2,663	2,818	786.00	0	786.20	0	14,537.24	15,323.44		
South Carolina	12	0	12	0	401	413	40.50	0	40.50	0	3,099.57	3,140.07		
Tennessee	226	0	226	0	1,004	1,230	633.14	0	633.14	0	6,338.68	6,971.82		
Virginia	950	6,541	7,491	0	4,393	11,884	1,041.92	9,305.08	10,347.00	0	20,413.93	30,760.93		
West Virginia	426	0	426	63	1,419	1,908	868.50	0	868.50	158.51	6,548.60	7,575.61		
Total	1,780	6,541	8,321	972	12,763	22,056	3,489.07	9,305.08	12,016.01	2,548.53	65,096.38	80,448.26		

¹Part of the land in Wolf County, Kentucky is under option by the Forest Service and will eventually belong to the National Forest. In 1934 it was considered all privately owned.

²Of these cultivated bushes 450 in Georgia and 718 in South Carolina were escaped bushes. There were escaped cultivated bushes pulled in other states but no exact record was kept of them.

NURSERY SANITATION IN SOUTHERN APPALACHIAN STATES IN 1934.

SHEET I

State	Nursery	Location	C o n t r o l R e c o r d					C o s t R e c o r d			
			White pine in nursery	Acreage examined	Man-days	Ribes removed	Ribes not removed	Indivi- dual costs	State costs	Federal ¹ costs	Total costs
Georgia	Mt. Experiment Station		30,000	25	0.5	8	0	0 0	\$2.00	\$2.00	Initial
Maryland	Gude & Sons, A.	Ashton, Derwood	8,000	372	1.	0	?		5.00	5.00	Reworking
	Quaint Acres Nursery	Silver Spring	100	186	1		0		5.00	5.00	"
	Rolandhurst Nursery	Hebron	200	186	2		0		9.00	9.00	"
	Small & Sons, J.H.	Norbeck	3,744	186	1	8	0		5.00	5.00	"
	Towson Nurseries		5,350	372	2		18		10.00	10.00	"
	Total		17,394	1,302	7	8	18		34.00	34.00	
Tennessee	Bledsoe State Forst Nursery		60,000	500	3	0	0	0 0	12.48	12.48	Initial
Virginia	Alta Vista Nursery	Alta Vista	1,800	186	1.	0	0		5.00	5.00	Reworking
	Jones, E.W. & Co.	Woodlawn	5,000	186	2.5	0	0		12.50	12.50	"
	State Forest Nursery	Charlottesville	30,000	186	0.5	0	0		2.50	2.50	"
	Titus Nursery Co.	Waynesboro	500	280	6.5	62*	0		30.50	30.50	"
	Westcott Nursery	Falls Church	14,385	200	3.0	247*	0		15.00	15.00	"
	Total		51,685	1,038	13.5	309	0		65.50	65.50	
West Virginia	U. S. Forest Service	Parsons	831,000	575	181.0	3,256*	29	0 0	527.15) 40.00)	57.15	Reworking Job of inspection
	Grand totals for region		990,079	3,440	213.0	3,581	47	0 0	681.13	681.13	
Initial Work											
Georgia			30,000	25	0.5	8	0	0 0	2.00	2.00	
Tennessee			60,000	500	3.0	0	0	0 0	12.48	12.48	
	Totals		90,000	525	3.5	8	0	0 0	14.48	14.48	
Reworking											
Maryland			17,394	1,302	7.	8	18	0 0	34.00	34.00	
Virginia			51,685	1,038	13.5	309	0	0 0	65.50	65.50	
West Virginia			831,000	575	189.0	3,256	29	0 0	567.15	567.15	
	Totals		900,079	2,915	209.5	3,573	47	0 0	666.65	666.65	
	Grand totals		990,079	3,440	213	3,581	47	0 0	681.13	681.13	

*52 *R. americanum* were native at Titus Nursery

3231 gooseberries " " " Parsons "

Total 3283 Native bushes. 200 seedlings. Gooseberries at Westcott's had escaped from cultivation.

¹ Federal costs are estimated at \$5.00 per day for Sheals, Fracker and Pierce, \$4.00 for other inspectors and actual cost for labor, E.C.W. labor being credited at \$1.00 per day.

NURSERY SANITATION WORK IN SOUTHERN APPALACHIAN STATES IN 1934
From Standpoint of Federal Inspection and Permit

SHEET J

State	Nursery	Location	Date of inspection	Inspector	Man days labor	Cost ¹	Ribes removed	Status of Federal permit for interstate Shipment of white pines		
								Date of approval	Territory covered by permit	
Virginia	Titus & Co.	Waynesboro	4/12-13/34)	Sheals					All except S.W. ⁴	
			8/23/34)	"	4.5	\$22.50	54	8/30/34		
			6/1/34	Stevens, et al	2	8.	8 americanum			
			Total		6.5	30.50	62			
	Westcotts	Falls Church	4/3.5.6/34) ²	Sheals and Pierce	3.	15.00 ²	247	11/27/34	"	"
	Alta Vista	Alta Vista	11/26/34)	Sheals	1	5.00	0	9/7/34	"	"
Maryland	Jones, E.W. & Co.	Woodlawn	4/10/34	Sheals, Fracker	2.5	12.50	0	10/30/34	"	"
	State Forest	Charlottesville	4/11, 12/34	Sheals	0.5	2.50	0	9/1/34	"	"
			Total		13.5	65.50	309			
	Gude's	Ashton and Derwood	4/5-7/34	Sheals	1	5.00	0	9/1/34	Infected states	
	Harrison	Berlin		"	Not inspected in 1934 ⁵			8/7/33 ³	All except S.W.	
	Ley	Camp Springs		"	"	"	"			
	Quaint Acres	Silver Spring	4/5-7/34	"	1	5.00	0	8/30/34	"	"
	Rock Creek	Rockville		Not inspected in 1934					Allowed to ship to June 30, 1934 from Gude's stock at Ashton,	
	Rolandhurst	Hebron	5/22/34	Sheals & Hodgkins	2	9.00	0	8/30/34	All except S.W.	
	Small, J.H.	Norbeck	4/5-7/34	Sheals	1	5.00	8	9/14/34	Infected states	
West Virginia	State forest	Lakeland	Not inspected in 1934						Have not requested Federal permit	
	Towson	Towson	5/22/34							
			9/17/34	Sheals	2	10.00	0	9/18/34	Infected states for Pinus strobus only	
	Totals				7	34.00	8			
West Virginia	Parsons	Parsons	May		181	527.15	3256	9/18/34	Infected states and Tennessee	
			June		8	40.00				
			Total		189	567.15				
Georgia	State	Greenbottom		Pierce in 1932	Not inspected in 1934				Have not requested federal permit	
	Georgia Mt. Experiment Station		Fall 1934	Zimmer	0.5	2.00	8		"	"
									"	"
Tennessee	Bledsoe State Forest	Bledsoe Co.	"	Duggan	3	12.48	0		"	"
Grand total					213.0	\$691.13	3581			

¹ Travel to nursery not included in cost of inspection placed at \$5 per day for Sheals, Fracker and Pierce and at \$4 per day for Hodgkins, Stevens, et al

² This does not include cost of digging the 247 bushes of which 200 were seedlings borne by nursery nor the man-days labor spent by nursery in removing plants, data for which is lacking.

³ This permit expired June 30, 1934.

⁴ S.W. This permit authorizes shipping to destinations in all states except Arizona, California, Colorado, Nebada, New Mexico, Utah and Wyoming

⁵ White pine stock in nursery "was drowned" out by high water.

SUMMARY OF INFORMATIONAL AND SERVICE ACTIVITIES IN SOUTHERN APPALACHIAN DISTRICT 1934

SHEET K

	Meetings addressed	Attendance	Items published	Educational display	Initial interviews	Follow-up calls	Publica- tions distributed	Individuals instructed	Posters placed	Demonstra- tions placed	Mimeographed articles distributed	Radio broadcasts	Letters to nursery- men
Georgia	-	-	18	1	4,542	534	2,647	-	12	-	-	-	-
Kentucky	-	-	4	-	728	-	135	55	3	-	15	-	10
Maryland	27	533	8	1	1,287	32	2,676	-	18	-	-	-	-
North Carolina	6	83	24	-	2,438	257	2,962	25	37	11	-	2	-
South Carolina	4	146	7	2	833	136	655	162	15	-	0	-	-
Tennessee	-	-	17	1	-	-	448	950	18	1	26	-	-
Virginia	15	854	10	0	952	95	229	504	72	0	47	-	-
West Virginia	1	10	3	1	615	12	500	78	53	1	-	-	-
Total	53	1626	91	6	11,395	1,066	10,252	1,774	228	13	88	2	10

BLISTER RUST CONTROL SUMMARY OF PERSONNEL 1934*
Including Nursery Sanitation

TABLE L

Southern Appalachian Region.

	E. C. W.				P. W. A.						Total Number of persons employed E.C.W. & P.W.A.		
	No. of camps	No. of checkers and foremen	No. of enrollees	Total No. of men	Number of persons employed					Names on two lists to be subtracted		Number of persons omitting duplicates	
					Leader	District agents	Scouts and foremen	Clerks or stenographers	Laborers				Total
Georgia	1	1	0	1	1	1	0	0	13	15	0	15	16
Kentucky	0	0	0	0	1	2	1	2	37	43	0	43	43
Maryland	2	2	13	15	1	0	4 ¹	1	43	49	1	48	63
North Carolina	1	1	4	5	1	7	9	3	45	65	5	60	65
South Carolina	0	0	0	0	1	0	0	1	10	12	0	12	12
Tennessee	6	2	25	27	1	4	31	1	7	44	0	44	71
Virginia	10	6	132	138	1	7	20	1	225	254	3	251	389
West Virginia	2	2	28	30	1	4	5	1	19	30	1	29	59
District of Columbia	0	0	0	0	1	-	-	1	0	2	0	2	2
Gross total	22	14	202	216	9	25	70	11	399	514	10	504	719
Duplicate names		1		1									
To be subtracted duplicate names (Clyde Stevens in E.C.W. and P.W.A.)													1
Net total number of workers		13	202	215								504 minus 1	= 718

*This data compiled from payroll records in Washington, D.C.

¹

Includes D.H. Fitzwater, checker in Maryland, Virginia and West Virginia, not listed under Virginia or West Virginia.

SUMMARY OF PERSONNEL ON BLISTER RUST WORK - 1934

Location	E.C.W.		P.W.A.		F.E.R.A.		REGULAR		TOTAL
	No. Camps	No. Men	No. Camps	No. Men	No. Camps	No. Men	No. Camps	No. Men	
<u>Eastern White Pine Region</u> Northeastern States Lake States Appalachian States	22	215	0	504	0	0	0	0	718 *
Sub-Total for East									
<u>Western White Pine Region</u> (Northwestern Mont., Northern Idaho & Northeastern Wash.)									
<u>Sugar Pine Region</u> (Southern Oreg. & Calif.)									
Sub-Total for West									
GRAND TOTALS									

* One man, Clyde Stevens, was in both E.C.W. and P.W.A., hence the total is one less than the number of E.C.W. men and P.W.A. men.

JFM/mc
8/27/34

WOH
3/22/35

----- 0 0 0 -----

SOUTHERN APPALACHIAN REGION

SUMMARY OF CONTROL WORK FOR 1 9 3 4
(By Programs)

Excluding Nursery Sanitation In-
cluding Initial Eradication and
Reworking

Program	Acres Erad. of Ribes	No. Ribes Destroyed	Cost of Erad. Ribes	No. Man-days	Per Acre		
					No. Acres per Man-day	No. Ribes	Cost Man-days
E. C. W.	61,945	758,984	\$14,576.95	9,141	6.8	12.2	0.235
P. W. A.	1,095,940	1,595,393	65,871.31	12,915	84.8	1.5	0.060
F.E.R.A.	0	0	0	0	0	0	0
REGULAR	0	0	0	0	0	0	0
TOTALS	1,157,885	2,354,377	\$80,448.26	22,056	52.5	2.0	0.069

JFM/mc

8/27/34

woh

3/26/35

Z

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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SUMMARY OF BLISTER RUST CONTROL EXPENDITURES IN SOUTHERN
APPALACHIAN REGION

For Fiscal and Calendar Years 1933 & 1934

State	Fiscal Year 1933	Calendar Year 1933	Fiscal Year 1934	Calendar year 1934
Georgia (State			\$100.00	\$660.00
(Federal		\$12.02	1,169.71	4,632.24
Total		\$12.02	\$1,269.71	\$5,292.24
Kentucky (State			50.00	290.00
(Federal		37.44	416.61	6,277.03
Total		37.44	\$466.61	\$6,567.03
Maryland (State	\$646.25	1,069.20	1,102.50	1,323.20
(Federal	931.62	3,936.87	8,241.12	12,847.50
Total	1,577.87	5,006.07	9,343.62	14,170.70
North Carolina (State	100.00		507.00	987.00
(Federal	931.61	504.18	3,136.75	17,069.29
Total	1031.61	504.18	3,643.75	18,056.29
South Carolina (State			95.00	305.00
(Federal		11.99	850.58	3,352.40
Total		11.99	945.58	3,657.40
Tennessee (State			113.00	594.00
(Federal		36.84	1,863.71	8,167.01
Total		36.84	1,976.71	8,761.01
Virginia (State	176.51	28.28	260.00	594.00
(Federal	931.60	593.18	2,454.82	22,890.60
Total	1108.11	621.46	2,714.82	23,484.60
West Va. (State	121.95	311.71	181.01	200.00
(Federal	931.61	558.69	1,446.70	9,304.12
Total	1053.56	870.40	1,627.71	9,504.12
Grand total	7,100.40	7,100.40	21,988.51	85,493.39

Compiled by Severin Ulmer,
March 1935.

G E O R G I A

ANNUAL REPORT

BLISTER RUST CONTROL IN GEORGIA

1934, up to October 31st inclusive

by

W. V. ZILLER JR.

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THE
JOURNAL OF THE
ROYAL ANTHROPOLOGICAL INSTITUTE
OF GREAT BRITAIN AND IRELAND
PUBLISHED BY THE INSTITUTE
OF GREAT BRITAIN AND IRELAND

1891

1. MAPS:

U. S. G. S. Maps, with White Pine areas enclosed by green lines and small, letter size, map of the State with Area worked during the Eradication Season of 1934 shown in BLUE: Important White Pine producing Counties, to be worked next, shown in BROWN and Counties of less importance but containing good Commercial Stands of White Pine, shown in ORANGE.

2. COUNTIES IT IS INTENDED TO WORK NEXT:

MURRAY, FANNIN, PICKENS, DAWSON, LUMPKIN, WHITE and HABERSHAM. OF SECONDARY IMPORTANCE: Dade, Walker, Catoosa, Whitfield, Gordon, Bartow, Cherokee, Forsyth and Stephens. (Bartow, Dade & Forsyth Counties have been added to the original list due to statements made by Lumbermen and Mill Owners who assure us that these Counties contain White Pine in sufficient quantities to warrant protection.

3. NUMBER OF RIBES DESTROYED * * BY COUNTIES:

RABUN 4,956, TOWNS 2,726, UNION 1,351, GILMER 3,476.

TOTAL 12,509.

3. (a) NUMBER OF RIBES LOCATED BUT NOT DESTROYED * * BY COUNTIES:

RABUN 528, TOWNS 215, UNION 87, GILMER 982, TOTAL 1,812.

4. NUMBER OF PLACES IN WHICH RIBES HAVE BEEN DESTROYED: BY COUNTIES.

RABUN 80, TOWNS 77, UNION 41, GILMER 99. TOTAL 297.

4. (a) NUMBER OF PLACES RIBES HAVE BEEN LOCATED AND NOT DESTROYED:

BY COUNTIES:

RABUN 48, TOWNS 5, UNION 8, GILMER 32, TOTAL 93.

5. WHITE PINE * BY COUNTIES * (ESTIMATE)

RABUN 8,800, TOWNS 2,640, UNION 6,240, GILMER 26,560.

TOTAL 44,240 ACRES.

FINAL REPORT * END OF ERADICATION SEASON * GEORGIA * NOVEMBER 1st, 1934

6. OWNERSHIP:

PRIVATE (NO ATTEMPT HAS BEEN MADE TO ESTIMATE GROWTH IN THE NATIONAL OR STATE FORESTS)

7. CHARACTER OF GROWTH:

A MAJORITY OF THE WHITE PINE, ON THE ACREAGE LISTED ABOVE, IS 15 YEARS OF AGE OR OLDER. IN MANY INSTANCES THERE ARE AREAS WHICH CONTAIN STANDS OF MATURE WHITE PINE WHICH WILL RUN NOT LESS THAN TWO TO ONE.

8. ADAPTABILITY:

WHITE PINE IS ADAPTABLE TO THE SOUTHERN RANGE OF THE BLUE RIDGE:

IT HAS BEEN NOTED THAT THE GROWTH OF THE WHITE PINE IS EXCELLENT (IN THE NANTAHALA & CHEROKEE NATIONAL FORESTS, THE VOGEL STATE FOREST AND ON PRIVATE LANDS).

9. REPRODUCTION:

REPRODUCTION IS GOOD:

DUE TO THE EXAMPLE SET BY THE FORESTRY DEPARTMENT IN KEEPING OUT THE WOODS FIRES WHITE PINE IS BEING GIVEN A CHANCE TO REPRODUCE NORMALLY AND THROUGHOUT THE ENTIRE RANGE IT IS INCREASING RAPIDLY, NOT ONLY IN NUMBER BUT IN AREA i.e. (IT IS SPREADING ALONG PRACTICALLY EVERY STREAM AND IN WOOD LOTS THAT HAVE BEEN CUT OVER THERE IS AN EVER INCREASING NUMBER OF WHITE PINE AMONGST THE YOUNGER GROWTH. NOTE: IN CONVERSING WITH FARMERS, LUMBERMEN, SAW MILL OPERATORS, FORESTERS, STATE HIGHWAY ENGINEERS and others, we have been informed that they have noted the increase in the White Pine growth and likewise the interest that is being taken, by the land owners, in their White Pine.

OUTLINE OF BLISTER RUST CONTROL

GEORGIA 1934

White Pine Blister Rust Control was carried on in the state in 1933 by Messrs. R. M. Beeman and W. H. Warriner. At that time, only land that was a part of the Cherokee and Nantahala National Forests was worked. On the Cherokee, out of an area of 1,720 acres, 1030 acres of white pine were worked and on the Nantahala, 7,131 acres of white pine were scouted. This makes a total of 8,161 acres of pine scouted and a total acreage worked, 8,851. Of this, 739 acres, adjacent to Federal lands, were privately owned. (From Report of Blister Rust Control in Georgia, 1933, by Mr. Roy G. Pierce.) No Ribes, either wild or cultivated, were found.

On May 2, 1934, Blister Rust Control was started on privately-owned lands, co-operative between the United States Department of Agriculture and the Georgia State Entomologist, Mr. M. S. Yeomans. State headquarters established at Dahlonega, Georgia, with Mr. W. V. Zimmer, Jr., as State Leader, and Mr. R. C. Heslop, Agent.

A general survey was made and it was found that twenty North Georgia counties, namely, Catoosa, Whitfield, Murray, Fannin, Union, Towns, Rabun, Lumpkin, White, Habersham, Gordon, Bartow, Cherokee, Forsyth, Dawson, Pickens, Gilmer, Dade, Walker, Stephens, contain commercial stands of White Pine the value of which warrants protection.

At the beginning of eradication work, the only Ribes known in the state

THEORY OF THE EARTH

CHAPTER I

1

The Earth is a sphere, and its surface is divided into two parts, the land and the water.

The land is divided into continents, islands, and peninsulas.

The water is divided into oceans, seas, and lakes.

The atmosphere is the layer of gas that surrounds the Earth.

The lithosphere is the solid part of the Earth's surface.

The hydrosphere is the part of the Earth that is covered by water.

The biosphere is the part of the Earth that is inhabited by living organisms.

The geosphere is the part of the Earth that is made of rocks and minerals.

The atmosphere is the layer of gas that surrounds the Earth.

The lithosphere is the solid part of the Earth's surface.

The hydrosphere is the part of the Earth that is covered by water.

The biosphere is the part of the Earth that is inhabited by living organisms.

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The atmosphere is the layer of gas that surrounds the Earth.

The lithosphere is the solid part of the Earth's surface.

The hydrosphere is the part of the Earth that is covered by water.

The biosphere is the part of the Earth that is inhabited by living organisms.

The geosphere is the part of the Earth that is made of rocks and minerals.

The atmosphere is the layer of gas that surrounds the Earth.

The lithosphere is the solid part of the Earth's surface.

were at Stone Mountain near Atlanta. This fact led us to believe that very few wild or cultivated Ribes would be found in the twenty pine-producing counties. Thus, our scouting and locating of Ribes began in Gilmer County on May 9, 1934, at which time we were only locating and listing cultivated Ribes without using any special effort to destroy the Ribes located. Due to the fact that so many cultivated Ribes were being located in Gilmer County and that part of Rabun County which we had worked before the date of July 2, 1934, a conference was held at Clemson, South Carolina, with Mr. Roy G. Pierce, and it was decided to make every effort to eradicate Ribes where and when found. Thus, on this date, our policy was changed. We then began to eradicate as many cultivated Ribes as possible with the consent of property owners and tenants. Full consent of both property owners and tenants has been given in all cases of destroyed Ribes with the exception of those that were removed from the Nantahala and Cherokee National Forests where no consent was necessary.

It was found in most cases that a detailed explanation of Blister Rust Control, showing the danger of Ribes and the easy spread of the disease, and supplemented by the use of illustrated pamphlets, was all that was necessary to obtain permission from property owners to destroy Ribes. In some cases where persons would not give consent to destroy Ribes, a record giving the landowner's name and his land lot number has been made. Even in a majority of these cases, however, the landowners have expressed their willingness to co-operate by destroying these bushes at such a time as Blister Rust is found in Georgia. It can be stated that co-operation on the part of the property owners has been ninety-eight per cent perfect.

The first part of the paper discusses the importance of the study and the objectives of the research. It also provides a brief overview of the methodology used in the study. The second part of the paper presents the results of the study and discusses the implications of the findings. The third part of the paper concludes the study and provides some final thoughts on the research.

References

1. Smith, J. (2010). The importance of the study and the objectives of the research. *Journal of Research*, 15(1), 1-10.
2. Jones, A. (2011). The methodology used in the study. *Methodology*, 16(2), 11-20.
3. Brown, C. (2012). The results of the study and the implications of the findings. *Results*, 17(3), 21-30.
4. White, D. (2013). The conclusions of the study and the final thoughts on the research. *Conclusions*, 18(4), 31-40.

In eradicating Ribes, special care has been taken to see that all roots were removed. Also, it has been found that covering the holes after the removal of Ribes is a great advantage in killing out the roots, as sections of roots will sprout more quickly and freely when left exposed than if covered deeply. Inspection in Gilmer County of places where Ribes were located at an abandoned house place and destroyed in May, 1934, show no sign of new sprouts in September, 1934. This, however, cannot be expected on a hundred per cent basis and it will be necessary to inspect and rework places where Ribes have been eradicated this season.

Ribes were reported to be at abandoned house places in the Nantahala Forest and were located and destroyed. Several of these places were scouted and 136 gooseberry bushes were eradicated in the third district, land lot No. 90, Rabun County. This information was obtained from people who had moved from these places when sold to the Forest. This applies also to the Cherokee National Forest. On Springer Mountain in Gilmer County, 278 gooseberry and 36 black currants were eradicated at an abandoned house place in the forest. In Union County, District 7, Land Lot No. 93, 85 gooseberry bushes were eradicated at two abandoned places. It is considered necessary to have attention given to these abandoned places within the forest for full eradication of Ribes and Pine protection.

It was found very much to our advantage to stop at all school houses and with permission of the teacher in charge, to distribute small pamphlets on Blister Rust Control to the pupils. In this way, news of our work and some information preceded us in our work over the county from the pamphlets which were carried home by the students. Our work in eradicating cultivated

[The text in this block is extremely faint and illegible. It appears to be a multi-paragraph document with various lines of text and some small, scattered characters or symbols.]

Ribes has been and must continue to be an educational program teaching the property owner why it will be an advantage to him to destroy these bushes without compensation from the State or Federal Government. If it can be made clear to the owner that this work is being done for the protection of his property, and for this purpose alone, no trouble is had in gaining his cooperation in removing and destroying Ribes.

To date, we have not found any wild Ribes in Georgia. Those found have been cultivated and some have been found that can be classified as escapes; that is to say they have been at abandoned house places for 15 to 50 years and in some cases, have spread over a considerable area.

At the close of the eradication season, namely, October 31, 1934, 12,509 Ribes have been eradicated in the four counties worked as follows: Gilmer County 3,476; Towns County 2,726; Union County 1,351; Rabun County 4,956.

Ribes located but not destroyed number 1,812 in the counties as follows:

Gilmer County 982; Towns County 215; Union County 87; Rabun County 528. Complete maps and record sheets showing this work were submitted the latter part of November to the Washington office as well as to the Georgia State Entomologist. Also to the Georgia Forestry Department. Between 50 and 60 photographs showing stands and growth of White Pine in Georgia counties also went along with this report to the Washington office.

Work during the month of November, 1934, was devoted to getting maps and records in order for the final report at the end of the eradication season, October 31, 1934. December, 1934, we returned to the field and made an accurate survey of the Pine acreage in Rabun County with the result of 6,813

1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows: Section 2 describes the system and the factors being investigated. Section 3 presents the experimental design and the results of the experiments. Section 4 discusses the implications of the results and provides conclusions.

2. System Description

The system under investigation is a complex system with multiple components. The factors being investigated are the input variables that affect the system's performance. The system is modeled as a black box, and the input variables are varied to observe the system's response.

3. Experimental Design

The experiments were conducted using a factorial design. The input variables were varied independently, and the resulting system performance was measured. The results of the experiments are presented in Table 1.

4. Results and Discussion

The results of the experiments show that the system's performance is significantly affected by the input variables. The most significant factor is the input variable X, which has a strong positive effect on the system's performance. The other input variables have a smaller effect on the system's performance.

5. Conclusion

The study has shown that the system's performance is significantly affected by the input variables. The most significant factor is the input variable X, which has a strong positive effect on the system's performance.

6. References

[1] Smith, J. D. (1998). The effects of input variables on system performance. *Journal of Systems Management*, 49(1), 1-10.

[2] Jones, K. L. (2001). The impact of system architecture on performance. *IEEE Transactions on Systems, Man, and Cybernetics*, 31(1), 1-10.

acres. This, along with all pine record sheets and locations on maps (Walhalla Quadrangle) is complete. Total expenditures up to December 31, 1934, amounted to \$3,444.07. Salary and expenses for W. V. Zimmer, Jr., and R. C. Heslop, agents, amounted to \$3,072.87. Salary for 15 men used as labor from Re-employment offices over the four counties worked amounted to \$371.20. Total hours for supervision 2,292, total hours for labor 928 (July 1 to October 31, 1934).

During the eradication season very little attention was given to estimation of Pine acreage other than to locate and note Pine in commercial stands that warrant protection. It is planned to carry on accurate acreage estimating of Pine during the winter months as well as to estimate age and growth of Pine. It was considered advisable to spend as much time and to cover as much territory as possible before the falling of the foliage on Ribes made this work impossible.

It is estimated that it will take twelve to eighteen months to complete eradication work in the remaining counties. During this time it would be advisable to rework those counties worked this season. This work could be easily and rapidly done, as all data is on hand for relocation of these places. It would be of great advantage to rework the four counties early this spring. This work could be done with no lost time and very little expense thus making sure that ground covered is fully protected and safe. These counties should be covered in four to six weeks by one agent and one laborer.

The growth of young pine all over the twenty North Georgia counties is

The first part of the paper discusses the importance of understanding the social context of the research. It is essential to consider the cultural, historical, and political factors that may influence the results. The second part of the paper describes the methodology used in the study. This includes a detailed description of the sample, the data collection methods, and the statistical analysis. The third part of the paper presents the results of the study. These results are discussed in the context of the research objectives and the existing literature. The final part of the paper provides a conclusion and discusses the implications of the findings for future research.

The results of the study indicate that there is a significant relationship between the variables of interest. This relationship is consistent across the different groups and time points. The findings suggest that the intervention had a positive effect on the outcome variable. However, there are some limitations to the study that should be noted. These include the relatively small sample size and the potential for confounding factors. Despite these limitations, the study provides valuable insights into the effectiveness of the intervention.

In conclusion, the study demonstrates the importance of considering the social context in research. The findings suggest that the intervention was effective in improving the outcome variable. Further research is needed to confirm these findings and to explore the underlying mechanisms. The study also highlights the need for careful consideration of the limitations and potential biases in research.

The authors would like to thank the participants and the research assistants who made this study possible. They also thank the funding agency for their support. The authors declare that they have no conflicts of interest.

very gratifying. The soil and climate, moisture, etc. seem to contain all that is necessary for the rapid and healthy growth of White Pine. The public, lumber and saw mill men seem to be taking more interest in this type of pine than ever before. The Georgia State Forestry Department with its Experiment Station in Union County has twenty-five acres of White Pine seedlings from three to five years of age with approximately 30,000 trees. It is noticed that a great number of people are planting White Pine in their yards and around their premises for ornamental purposes. Practically all persons contacted have shown interest in the work and protection of White Pine.

Plans for the 1935 eradication season are under way for the enlarging of the field forces and the rapid covering of the remaining counties.

W. V. ZIMMER, JR. (State Leader),
Blister Rust Control,
Dahlonega, Georgia.

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY

AND

THE GEORGIA STATE ENTOMOLOGIST

Cooperative Work in Controlling White Pine Blister Rust in Georgia

The object of the cooperative work outline herein is to provide for scouting and inspection for the white pine blister rust in Georgia and for the application of such methods of eradication or control as may be necessary.

A. The United States Department of Agriculture, Bureau of Plant Industry Agrees:

- (1) To pay the salaries and necessary travel expenses of one or more men for such time as may be necessary to determine the occurrence and limits of the spread of this disease in Georgia, and under the authority of the Georgia State Entomologist and his cooperators shall cooperate in the eradication of the disease wherever found.
- (2) To assume responsibility for technical instruction of employees engaged in these investigations.
- (3) To conduct such experiments and demonstrations as may be desirable for the purpose of securing effective control of the white pine blister rust in Georgia.

B. The Georgia State Entomologist agrees:

- (1) To assume the administrative direction of the aforesaid employees of The United States Bureau of Plant Industry.
- (2) To conduct such survey and control activities as may be agreed upon each year by the cooperating parties.
- (3) To prepare an annual report of all blister rust control work performed under the provisions of this memorandum, one copy of which will be delivered to each of the cooperating parties.
- (4) To submit in prescribed form to the United States Bureau of Plant Industry a monthly report of salaries and expenses paid by the State on blister rust control work.
- (5) To have all salary and expense vouchers of temporary employees to be paid out of Federal funds approved by the individual directly in charge of supervising cooperative blister rust control work in the State before being submitted to the United States Bureau of Plant Industry for payment. This individual shall be under appoint-

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ment as collaborator without compensation in the United States Department of Agriculture. All Federal funds expended in connection with this cooperative work shall be disbursed in accordance with the fiscal regulations of the United States Department of Agriculture.

- (6) To undertake such destruction of white pines or Ribes in Georgia and such enforcement of State Laws as may be necessary for the effective prosecution of blister rust control work.
- (7) To deputize and authorize the aforesaid employees of the United States Bureau of Plant Industry to destroy such pines, currants and gooseberries as may be necessary and as provided for by the State laws.

C. It is Mutually Agreed:

- (1) That the details of this cooperative work shall be planned and executed jointly by the Bureau of Plant Industry through its Division of Blister Rust Control and the Georgia State Entomologist.
- (2) That this memorandum of understanding shall take effect July 1, 1933, and continue in effect until June 30, 1935, provided, that either party may terminate the agreement at any time by a written statement to that effect 30 days in advance of the date of termination desired.
- (3) That all persons appointed by the United States Bureau of Plant Industry and its cooperators under this memorandum shall be satisfactory to the cooperative parties.
- (4) That the results of the cooperative work may be published jointly, or upon mutual agreement, by either cooperating party, with due credit given to the cooperating agencies. All manuscripts therefor, shall be criticised by the cooperating parties before publication and, all form letters, bulletins and any other circulars to be mailed in penalty envelopes shall be submitted in manuscript form for approval by the United States Department of Agriculture before being printed or sent out, in accordance with Postal Law.
- (5) That any expenditures involved in the work herein assumed by the United States Bureau of Plant Industry are contingent upon appropriations made by Congress for continuance of these activities, but no Federal funds shall be expended in compensation for host plants destroyed in control work.
- (6) That for the fiscal term July 1, 1933, to June 30, 1935, the Georgia State Entomologist and his cooperators, including the Georgia Department of Forestry, will expend about \$500.00

and the Federal Government in behalf of the United States Bureau of Plant Industry about \$6,000.00 in connection with the work herein provided for, provided, however, that the maximum expended by the Federal Government shall not exceed \$7,000.00.

In witness whereof the parties hereto have severally signed these presents on the respective days and dates hereinafter set forth.

/SIGNED/ M. S. YEOMANS March 31, 1934.
Georgia State Entomologist

/Signed/ Apr. 16 - '34 K. F. KELLERMAN
Acting Chief, Bureau of Plant Industry, U. S.
Department of Agriculture.

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2/7/35

1. The first part of the paper is devoted to a general discussion of the problem of the existence of solutions of the system of equations

which is the subject of the present paper.

2. In the second part of the paper we shall consider the case of the system of equations

which is the subject of the present paper.

RIBES LOCATED NOT ERADICATED

GILMER COUNTY, GEORGIA

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
J. Berry	148	7	Gooseberry	10
E. D. Simmons	251	12	"	1
W. Simmons	251	12	"	5
S. Dobbs	E. Ellijay		"	10
W. S. Sawyer	" "		"	2
E. Barnes	256	11	"	100
W. O. Plumbly	108	11	"	3
A. Kell	313	10	"	23
L. Smith	32	12	"	25
H. Head	147	10	"	25
R. Bennett	79	26	"	350
J. W. Pettitt	105	6	"	10
H. T. Dover	288	10	"	7
A. Miller	172	7	"	4
J. Key	128	10	"	4
J. Hyatt	214	25	"	12
H. Hyatt	256	25	"	12
D. W. Letterman	189	25	"	91
S. M. Banks	110	25	"	6
W. V. Quarles	250	25	"	125
L. Rice	219	11	"	75

(Continued from Page 12)

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
S. M. Holdt	207	6	Gooseberry	50
C. Harriss	112	7	"	17
B. Tifton	186	7	"	3
W. O. Miller	90	10	"	6
R. D. Miller	160	10	"	4
B. Jones	171	10	"	5
J. E. Bowden	240	10	"	3
C. C. Davis	277	10	"	1
J. G. Clayton	192	6	"	4
L. Simmons	252	12	"	3
L. M. Sutton	312	11	"	10
TOTAL				982

THIS IS FINAL REPORT AT CLOSE OF ERADICATION SEASON OCTOBER 31, 1934.

Table 1: Summary of Data

Category A					
1	2	3	4	5	6
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1003	1004	1005	1006	1007	1008
1009	1010	1011	1012	1013	1014
1015	1016	1017	1018	1019	1020
1021	1022	1023	1024	1025	1026
1027	1028	1029	1030	1031	1032
1033	1034	1035	1036	1037	1038
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1045	1046	1047	1048	1049	1050
1051	1052	1053	1054	1055	1056
1057	1058	1059	1060	1061	1062
1063	1064	1065	1066	1067	1068
1069	1070	1071	1072	1073	1074
1075	1076	1077	1078	1079	1080
1081	1082	1083	1084	1085	1086
1087	1088	1089	1090	1091	1092
1093	1094	1095	1096	1097	1098
1099	1100	1101	1102	1103	1104
1105	1106	1107	1108	1109	1110
1111	1112	1113	1114	1115	1116
1117	1118	1119	1120	1121	1122
1123	1124	1125	1126	1127	1128
1129	1130	1131	1132	1133	1134
1135	1136	1137	1138	1139	1140
1141	1142	1143	1144	1145	1146
1147	1148	1149	1150	1151	1152
1153	1154	1155	1156	1157	1158
1159	1160	1161	1162	1163	1164
1165	1166	1167	1168	1169	1170
1171	1172	1173	1174	1175	1176
1177	1178	1179	1180	1181	1182
1183	1184	1185	1186	1187	1188
1189	1190	1191	1192	1193	1194
1195	1196	1197	1198	1199	1200
1201	1202	1203	1204	1205	1206
1207	1208	1209	1210	1211	1212
1213	1214	1215	1216	1217	1218
1219	1220	1221	1222	1223	1224
1225	1226	1227	1228	1229	1230
1231	1232	1233	1234	1235	1236
1237	1238	1239	1240	1241	1242
1243	1244	1245	1246	1247	1248
1249	1250	1251	1252	1253	1254
1255	1256	1257	1258	1259	1260
1261	1262	1263	1264	1265	1266
1267	1268	1269	1270	1271	1272
1273	1274	1275	1276	1277	1278
1279	1280	1281	1282	1283	1284
1285	1286	1287	1288	1289	1290
1291	1292	1293	1294	1295	1296
1297	1298	1299	1300	1301	1302
1303	1304	1305	1306	1307	1308
1309	1310	1311	1312	1313	1314
1315	1316	1317	1318	1319	1320
1321	1322	1323	1324	1325	1326
1327	1328	1329	1330	1331	1332
1333	1334	1335	1336	1337	1338
1339	1340	1341	1342	1343	1344
1345	1346	1347	1348	1349	1350
1351	1352	1353	1354	1355	1356
1357	1358	1359	1360	1361	1362
1363	1364	1365	1366	1367	1368
1369	1370	1371	1372	1373	1374
1375	1376	1377	1378	1379</	

RIBES ERADICATED

GILMER COUNTY, GEORGIA

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
Ora Dover	79	26	Gooseberry	189
R. Clourde	45	26	"	5
A. E. Edwards	141	10	"	36
H. D. Parks	8	26	"	14
J. E. Shepard	9	26	"	36
G. M. Parks	217	10	"	54
E. M. Wells	27	26	"	8
L. Parks	27	26	"	12
J. L. Parks	275	10	"	47
C. Hyde	252	26	"	51
C. W. Dover	218	10	"	4
G. Ash	321	25	"	12
L. Ellitt	298	25	"	8
Aban. Place	174	11	"	118
C. Melton	185	11	"	48
Key Property	156	10	"	25
A. C. Pankey	207	25	"	25
B. P. Burgess	220	25	"	48
S. Sanford	182	25	"	59
O. P. Melton	210	11	"	30
W. Davis	220	11	"	25
O. G. Bryan	210	25	"	120
R. A. Ralston	226	25	"	6
R. L. Henderson	261	25	"	8
H. Parks	45	10	"	91
E. W. Watkins	168	11	"	33
J. C. Bramblett	93	11	"	6
J. F. Call	242	11	"	4
T. Wright	219	6	"	6
H. Sanford	298	6	"	49
J. J. Osborn	307	11	"	12
J. Stewart	95	6	"	25
G. L. McArthur	252	6	"	2
W. James Ella Gap	188	11	"	2
G. Weaver	13	6	"	20
E. L. Searcy	140	7	"	6
W. H. Wishon	77	7	"	9
" " "	77	7	Black Currants	171
W. T. Holloway	71	7	Gooseberry	1
G. Holloway	72	7	"	21
J. Wishon	103	7	"	101

(Continued from p. 14)

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
J. Wishon	103	7	Black Currants	3
" "	79	7	Ditto	17
" "	79	7	Do.	51
W. L. Rogers	144	7	Red Currants	9
W. Chapman	108	10	Gooseberry	12
L. E. Chapman	90	10	"	18
W. O. Miller	91	10	"	1
M. I. Orvis	194	10	"	4
B. R. Vandergriff	163	11	"	9
L. L. Johnson	180	6	"	21
W. M. Mashburn	180	6	"	3
R. H. Holdt	189	6	"	4
T. Hudson	145	6	"	3
J. E. Wright	2			
J. E. Wright	248	6	"	7
J. M. Chastain	247	6	"	8
W. M. West	279	6	"	62
M. Mathews	297	6	"	3
A. E. West	278	6	"	2
J. E. Southern	207	6	"	31
I. C. Anderson	204	6	"	22
J. A. McClure	260	6	"	9
W. Parker	126	6	"	39
P. Weaver	198	6	"	5
W. W. Southern	23	5	"	35
Rev. Speer	186	6	"	112
E. R. Childers	279	6	"	8
E. W. Watkins	112	6	"	15
S. G. Clayton	114	6	"	42
" " "	113	6	"	3
" " "	171	6	"	26
" " "	172	6	"	9
A. L. Kimsey	124	6	"	37
" " "	124	6	Black Currants	2
J. B. Weaver	26	6	Gooseberry	21
A. W. Cantrell	211	6	"	23
E. Forest	197	11	"	6
B. F. Evans	235	11	"	114
H. Evans	103	5	"	4
W. M. Cook	179	12	"	35
M. E. Long	313	11	"	73
L. D. Sutton	299	11	"	3
J. W. Chastain	302	11	"	12
W. D. Wright	276	11	"	2
J. L. Weaver	234	6	"	11
Henry Weaver	200	6	"	47
F. N. Weaver	16	6	"	183
J. C. Anderson	115	6	"	3
T. R. Harwick	234	10	"	4

(Continued from p. 15)

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
O. Carroll	148	10	Red Currants	27
W. T. Meace	77	10	Gooseberry	6
Cherokee National Forest	(Springer Mt.)		"	278
" " "	" "		Black Currants	36
W. L. Flannigan	33	11	Gooseberry	21
Georgia Power Company	127	6	"	64
M. Lydic	126	6	"	34
M. Underwood	148	7	"	97
J. Miller	174	7	"	17
J. Young	176	7	"	4
J. W. Withrow	109	10	"	50
W. M. Findley	293	12	"	56
" " "	302	11	"	12
E. Hudson	Ellijay		"	14
J. Dover	"		"	20
T O T A L				3,476

This is final report at close of Eradication Season, October 31, 1934

RIBES LOCATED BUT NOT ERADICATED

RABUN COUNTY, GEORGIA

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
J. H. Stancil	94	2	Gooseberry	7
" " "	94	2	Red Currants	1
N. Jiles	53	2	Gooseberry	8
J. B. Gillespie	118	2	"	12
A. Dillard	147	2	"	29
" "	147	2	Red Currants	16
A. H. Grice	192	2	" "	1
H. H. Baum	194	2	Black "	5
D. T. Lamb	192	2	Gooseberry	2
M. E. Brown	161	2	"	3
" " "	161	2	Red Currants	4
G. C. Dowell	Rabun Gap		" "	1
W. J. Watts	78	5	Gooseberry	20
J. Hollifield	40	5	"	2
A. Link	55	5	"	18
" "	55	5	Red Currants	30
P. Holcomb	56	5	Gooseberry	10
D. Crunkelton	54	5	"	15
L. Speed	14	3	"	1
J. D. Beck	19	3	"	10
M. Owens	101	3	Red Currants	2
B. M. Heddon	103	3	" "	4
" " "	103	3	Gooseberry	8
Dr. Wycliff	108	3	"	1
W. M. Stevens	54	3	"	4
H. A. Billingsly	53	3	"	2
D. G. Pitts	97	2	"	1
T. E. Parker	70	2	"	8
H. Howard	14	2	"	4
J. C. Jenkins	15	5	Red Currants	2
A. J. Lovewell	27	2	Gooseberry	6
G. W. Watts	29	5	"	4
" " "	29	5	Red Currants	2
I. H. Sutton	193	2	Gooseberry	8
M. McPherson	166	2	"	9
" "	166	2	Red Currants	2
G. W. Kelly	39	1	Gooseberry	15
E. P. Parker	38	1	"	3
R. Addis	48	1	"	2
M. Seals	23	2	"	14
J. A. Reynolds	25	2	"	4
W. M. Swafford	52	4	"	12

RESEARCH REPORT ON THE EFFECTS OF

CLIMATE CHANGE ON THE

WORLD

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(Continued from page 17)

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
B. F. Morgan	27	4	Red Currants	8
G. Smith	1	4	" "	1
G. L. Smith	23	4	" "	2
Tom Mitchell	20	5	" "	2
J. F. Stancil	27	4	Gooseberry	1
G. H. Rosenbusch	24	4	"	150
T. Mitchell	10	2	"	1
T. Roan	22	5	"	1
E. A. Teens	8	4	"	1
H. Perry	23	4	"	4
T. Owens	100	3	"	19
A. Owens	100	3	"	12
D. McCall	100	3	"	13
T O T A L				528

THIS IS FINAL REPORT AT THE CLOSE OF ERADICATION SEASON -- OCTOBER 31, 1934.

RIBES ERADICATED

Rabun County, Ga.

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
Aban. Place	90 & 91	3	Gooseberry	136
(Nantahala National Forest)				
Ga. Power Co.	11	3	"	24
J. M. Carver	52	4	"	2
W. Carver	52	4	"	2
J. E. Woodall	52	4	"	2
Aban. Place	96	3	"	4
" "	96	3	"	20
" "	93	3	"	27
" "	93	3	"	6
L. F. Rickman	21	5	"	69
W. E. Mangus	10	4	"	45
T. Smith	112	3	Red Currants	16
J. B. Jolly	24	3	Gooseberry	16
Ga. Power Co.	44	3	"	21
L. York	Mt. City		"	78
F. Cathey	" "		Red Currants	35
I. P. Coleman	102	2	Gooseberry	60
J. Mc Curry	92	2	"	17
" " "	92	2	Red Currants	8
A. Whitten	94	2	Gooseberry	14
E. Page	103	2	"	39
A. M. Keener	101	2	"	50
H. M. Dickerson	101	2	"	63
J. E. Dickerson	101	2	"	32
M. E. Keener	101	2	"	29
B. Moore	121	2	"	12
E. Page	103	2	"	31
A. Moore	102	2	"	133
C. A. Ayers	190	2	"	15
F. Blakely	165	2	"	24
" "	165	2	Red Currants	31
H. McCracken	7	5	Gooseberry	47
T. Burrell	7	5	"	286
J. R. Randolph	21	2	Red Currants	6
C. R. Jolly	21	2	" "	25
J. Harkins	165	2	" "	208
G. Bradley	184	2	Gooseberry	27
A. James	119	3	"	56
A. James	119	3	Red Currants	176
F. Blakely	193	2	" "	31

(Continued from p. 19)

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
M. Kell	192	2	Red Currants	18
T. Blakely	174	2	" "	323
D. R. Burrall	178	2	Gooseberry	21
L. M. Happ	156	2	Red Currants	16
S. Blakely	149	2	Gooseberry	89
T. M. Grice	144	2	Red Currants	156
W. S. Teague	145	2	Gooseberry	30
W. Zellender	25	2	"	15
L. Teague	24	2	"	86
F. Rogers	100	3	"	32
E. Tally	112	3	"	274
J. Owens	31	3	"	41
C. M. Snelling	Mt. City		"	332
" " "	" "		Red Currants	75
H. A. Marsengale	" "		"	44
" " "	" "		Gooseberry	135
W. L. Grice	117	2	"	31
" " "	117	2	Red Currants	46
J. E. Cox	63	2	Gooseberry	16
G. W. Darnell	135	2	"	30
F. Scruggs	106	2	Red Currants	6
T. Queen	22	2	Gooseberry	67
G. B. Prime	92	2	"	18
J. Justice	91	2	"	19
T. Byrnum	70	2	"	43
J. L. Rogers	42	2	"	275
J. Kilby	43	2	"	52
E. P. Parker	39	2	"	16
S. L. Thompson	18	2	"	29
J. T. Cannon	39	5	"	13
" " "	39	5	Red Currants	5
H. C. Blalock	38	5	Gooseberry	7
J. Holcomb	37	5	"	18
I. Craig	58	5	"	28
M. J. Bramblett	59	5	"	39
J. C. Robertson	78	5	"	9
W. M. Baker	86	5	"	61
V. Baker	85	5	"	17
R. E. Hamby	21	2	Red Currants	4
H. C. Blalock	116	2	Gooseberry	55
W. T. Bryan	116	2	"	244
" " "	116	2	Red Currants	36
S. Taylor	Mt. City		Gooseberry	31
M. L. Clark	" "		"	15
J. H. Taylor	" "		"	66

(Continued from page 20)

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NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
W. M. Hunnicutt	Mt. City		Gooseberry	14
W. R. Cannon	Clayton		"	18
S. C. Dobbs	29	5	"	5
" " "	29	5	Black Currants	7
" " "	29	5	Red "	36
T O T A L				4,956

This is final report at the close of Eradication Season - October 31, 1934.

RIBES LOCATED BUT NOT DESTROYED

Towns County, Georgia.

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
J. Rheinhardt	26	17	Goes eberry	2
G. W. Sparks	2	17	"	205
M. T. Sellers	112	18	"	1
G. Rogers	122	18	"	3
J. Ledford	99	18	Red Currants	4
T O T A L				215

This is final report at the close of Eradication Season - October 31, 1934.

RIBES ERADICATED

TOWNS COUNTY,
Georgia.

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NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
W. A. Jackson	172	17	Gooseberry	81
A. E. Green	171	17	"	43
G. Townsend	153	17	"	29
B. F. Sargent	135	17	"	6
M. H. Stephens	135	17	"	34
J. A. Curtis	100	17	"	8
M. S. Jenkins	99	17	Red Currants	17
B. B. Miller	118	17	Gooseberry	7
C. Corn	118	17	"	4
J. Hood	57	17	"	7
H. J. Caldwell	206	17	"	2
A. D. Thomas	207	17	"	6
S. H. Plott	Young Harris		"	317
G. McClure	138	17	"	8
E. Handy	102	17	"	37
A. Nichols	180	17	"	28
J. M. Berrong	118	18	"	70
J. W. Garrett	8	18	"	12
G. W. Russell	46	18	Black Currants	8
P. Ledford	46	18	"	2
A. Gibson	42	18	Red "	14
B. Henson	88	18	Gooseberry	21
F. Brown	80	18	"	5
R. Lloyd	80	18	"	31
C. C. Dean	118	17	"	67
J. E. Townsend	118	17	"	10
D. L. Keys	84	17	"	21
L. J. McClure	45	17	"	37
E. P. Hall	7	17	"	1
O. Sparks	2	17	"	8
D. E. Chastain	36	17	"	1
T. G. Brown	54	17	"	37
A. M. Stephens	38	17	"	45
J. Foster	50	17	"	26
M. Allison	15	18	"	17
H. J. Ledford	45	18	"	3
" " "	45	18	Black Currants	1
Franks & Sparks	87	17	" "	61
" " "	87	17	" "	339
T. E. Sellers	112	18	Gooseberry	73

(Continued from p. 23)

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
J. H. Garrett	55	18	Gooseberry	3
O. R. Bryson	152	18	"	6
" " "	152	18	Black Currants	9
C. C. Burch	116	18	Gooseberry	6
C. M. Nichols	112	18	"	87
W. Henson	118	18	"	10
R. Allen	120	18	"	17
F. J. Garrett	89	18	"	12
R. R. Bradshaw	90	18	"	29
G. Eller	167	18	"	16
" "	167	18	Black Currants	10
L. Eller	165	18	Gooseberry	21
J. Garrett, Jr.	87	18	"	53
J. Garrett	87	18	"	26
G. S. Dover	93	18	"	21
J. M. McCarter	97	18	"	23
W. Heddon	113	18	"	2
" "	113	18	Black Currants	26
V. M. Waldroup	111	18	Gooseberry	29
D. W. Franks	111	18	"	50
W. V. Moreland	90	18	"	39
D. W. Franks	48	18	Black Currants	331
B. Woods	144	18	Gooseberry	32
A. Foster	141	18	"	21
N. Brown	310	18	"	2
D. Mauldin	313	18	"	1
H. England	146	18	"	10
F. Brown	268	18	"	21
D. Berrong	138	18	"	12
W. J. Burrell	92	18	"	7
" " "	92	18	Black Currants	5
J. Eller	136	18	Gooseberry	26
A. Eller	127	18	"	11
" "	127	18	Black Currants	5
J. M. Taylor	193	18	Gooseberry	15
R. Roland	160	18	"	11
" "	160	18	Black Currants	8
W. L. Hooper	222	18	Red "	2
T. Potter	103	18	" "	37
S. Arrowwood	124	18	Black "	75
J. W. Beck	88	18	Red "	6
S. Bradley	122	18	" "	58
J. O. Sampson	Young Harris		Gooseberry	3
J. W. Johnson	Hiawassee		"	33
T O T A L				2,726

This is final report at the close of Eradication Season - October 31, 1934.

RIBES LOCATED BUT NOT DESTROYED

Union County, Georgia.

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
E. L. Ensley	260	17	Gooseberry	21
H. Dyer	165	16	"	1
G. L. Giles	112	9	"	4
R. H. Smith	140	9	"	5
" " "	140	9	R. Currant	4
L. Payne	51	7	Gooseberry	1
J. G. Jarrard	266	11	R. Currant	15
G. A. Cain	46	11	" "	20
A. Wimpy	297	10	Gooseberry	16
T O T A L				87

This is final report at close of Eradication Season - October 31, 1934.

RIBES DESTROYED
Union County, Georgia.

NAME	LAND LOT	DIST.	VARIETY	NO. of BUSHES
A. R. Butts	260	17	B. Currant	11
F. G. Sullivan	66	16	" "	1
F. A. Dyer	147	16	W. "	7
" " "	147	16	Gooseberry	17
E. C. England	163	16	R. Currant	11
J. T. Nix	164	16	Gooseberry	67
Vogel Land Company	162	16	R. Currant	1
L. W. Shuler	133	16	" "	1
" " "	133	16	Gooseberry	22
I. G. Fortenberry	126	10	"	3
C. A. Owenby	125	10	"	21
J. W. Fortenberry	87	10	"	58
Ga. Forest Exp. Sta.			"	8
N. Cavander	290	10	"	89
M. D. Pickelsimer	259	10	"	16
J. Harkins	294	10	"	4
F. Allison	295	10	"	119
B. Brown	23	10	"	23
E. A. Alexander	178	16	"	33
W. M. Coker	124	16	"	6
J. C. Hunt	70	10	"	4
N. L. Hemphill	35	10	"	6
L. Payne	15	16	B. Currant	3
H. Barnes	88	9	Gooseberry	7
J. M. Tow	93	7	"	15
Cherokee National Forest	93	7	"	54
" " "	93	7	"	31
W. M. Clemment	17	10	"	43
N. J. Harkins	68	9	"	9
L. A. Holloway	193	11	R. Currant	3
E. Cavander	288	10	Gooseberry	16
A. C. Hemphill	134	9	"	41
J. B. Souther	158	9	"	102
F. L. Young	113	9	"	41
S. A. Deaver	112	9	"	74
Gainsville Land Co.	241	9	"	6
J. Carver	319	10	"	19
J. L. Weaver	224	9	"	22
J. H. Walker	289	9	B. Currant	105
J. M. Akins	Blairsville		Gooseberry	12
T. S. Candler	298	10	"	208
L. Ingram	56	10	R. Currant	10
J. T. Caldwell	55	10	Gooseberry	2

1,351

T O T A L

This is final report at close of Eradication Season - October 31, 1934.

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APPENDIX TO GEORGIA ANNUAL REPORT COVERING ENTIRE YEAR 1934

SUMMARY OF INFORMATIONAL AND SERVICE ACTIVITIES IN GA. 1934

Items Published	Initial Inter- views	Follow up Calls	Publica- tions Distri- buted	Posters Placed	Educational Display
18	4,542	534	2,647	12	1

NURSERY SANITATION

Georgia 1934

Georgia Mt. Experiment Station
State Forestry Department
Acres in Nursery Protected 25
No. of white pines in Nursery
at end of year 30,000
Acres worked 25
Ribes pulled - cultivated 8
Man days labor - Agent (Estimated) 0.5
Cost of removal (Estimated)\$ 2.00

WHITE PINE LUMBER PRODUCTION IN GEORGIA AS REPORTED BY
THE MILLS

1911 - 3982 M. ft. B.M.
1912 - 3087 " " "
1913 - 3123 " " "
1914 - 4244 " " "
1915 - 3144 " " @ \$13.63 per M.
1916 - 1450 " "
1917 - 1575 " "

1918 -	2684	M.	ft.						
1919 -	1857	"	"	@	\$37.10	per	M.		
1920 -	2253	"	"	@	36.31	"	"		
1921 -	2157	"	"	@	19.43	"	"		
1922 -	4580	"	"	@	25.70	"	"		
1923 -	4773	"	"	@	33.99	"	"		
1924 -	3677	"	"	@	22.80	"	"		
1925 -	2302	"	"						
1926 -	1738	"	"	@	29.60	"	"		
1927 -	1483	"	"	@	25.09	"	"		
1928 -	1022			@	27.72	"	"	ft.	
1929 -	779			@	25.39	"	"	"	
1930 -	1405			@					
1931 -	612			@	21.49	"	"	"	
1932 -	697			@	20.02	"	"	"	

52624 million feet of white pine
lumber were produced in Georgia in the
22 year period 1911 to 1932 inclusive.

Data 1911 to 1925 from Statistical Bulletin 21, Part 4, U. S. Department of Agriculture, Data 1926 to 1932 bulletins of the U. S. Department of Commerce on Forest Products.

SCOUTING AND ERADICATION

Expenditures ----- 1934

Salaries paid from N.R.A.

Expenses

Agent Heslop		Leader Zimmer		Heslop		Zimmer	
May	\$108.75		\$130.50	\$106.06		\$111.70	
June	112.50		135.00	127.49		127.40	
July	118.74		142.50	131.95		146.50	
Aug.	118.74		142.50	154.80		161.25	
Sept.	118.74		142.50	133.60		147.15	
Oct.	118.74		142.50	159.25		166.45	
Chgd. to							
Erad.	696.21		835.50	813.15		860.45	
Nov.	118.74		142.50	0.90		13.80	
Dec.	118.74		142.50	145.45		139.33	
Total 2 Mos.	\$237.48		\$285.00	\$146.35		\$153.13	
GRAND TOTAL	\$933.69		\$1120.50	Charged to other acticitities.			

Zimmer's salary plus expenses	\$1695.95
Mr. Heslop - Dist. Agt. Salary plus expenses	1509.36
	<hr/>
TOTAL COST OF SUPERVISION	\$3205.31
Stenographic, Mrs. Moore - Nov.	5.00
Supplies & Equipment, Estimated	<hr/> 15.65

SCOUTING AND ERADICATION WORK

Personnel and Costs, 1 9 3 4.

Labor employed under N.R.A. funds:

<u>Month</u>	<u>Maximum No. of men</u>	<u>Man hours</u>	<u>Amount payroll</u>
May	4	212	\$84.80
June	3	254	106.40
July	2	252	100.80
August	4	274	109.60
September	3	220	88.00
October	2	182	72.80
		<hr/>	
		8 1374	\$562.40
		172	

Total different men (laborers) employed in Georgia up to October 31,
1934 - 13.

Days work performed by:

Agent R. Heslop	May 2 to October 31	142.5 days
Leader W. Zimmer	" 2 " " 31	<hr/> 142.5 "
		285.0

This excludes July 4 and Labor Day and counts Saturdays as half days.

(Data compiled by Pierce in Washington Office, 2/6/35.)

GEORGIA

Summary Blister Rust Control Expenditures

P. W. A. Project

I. Eradication Work - Period May 1 to October 31, 1934.

Total P.W.A. Cost \$3788.36 *

Subdivided as follows:

State Leader	\$1695.95
Scouts & Dist. Agents	1509.36
Labor for Eradication & Scouting	562.40
Stenographer in Nov.	5.00
Supplies & Equipment (Est.)	15.65
TOTAL	<u>\$3788.36</u>

* Through October 31, 1934.

II. Preeradication Survey and Office Work.

Period November 1 to December 31, 1934.

State Leader's Salary & Expenses...	\$438.13
Dist. Agent, Salary & Expenses	383.83
Labor	0.00
Supplies & Equipments	821.96

Total for the Year from January 1 to December 31, 1934 for
P. W. A. Work \$4609.32

SUMMARY OF E. C. W. WORK

I. Eradication and Scouting by Mr. R. M. Beaman, on Cherokee Natl. Forest.

(Continued on Page 31.)

Supervision - 11 man days	\$119.01	
Labor 0	0.00	
Total E.C.W. Work	\$119.01	\$119.01

SUMMARY OF P. W. A. & N.R.A. WORK

Total Cost of Eradication	\$3907.37	
Total Cost of Other Work	821.96	*
	<u>\$4729.33</u>	

* This figure may be changed later, due to disallowances and expenditures not yet entered in the books.

R. G. Pierce.

SUMMARY OF LOCAL CONTROL in 1934 by AGENCIES

All Initial Work

Agencies Acres White P. Ptd.	Acres Worked		Ribes Pulled					Ribes per Acre			
	Crew	Agents & Laborers	Total	Crew	Scout or Agt.	Total	Total all Ribes				
									Wild Cult.	Wild Cult.	Wild Cult.
E.C.W.	2214	0	6642	6642	0	0	235	0	235	.035	
P.W.A.	42240	0	126720	126720	0	0	0	12509(1)	0	12509	.098
Total	44454	0	133362	133362	0	0	0	12744	0	12744	.095

Man Days Labor Used	Costs				Supplies & Equipment	Total Cost	Cost per Acre Worked		
	Scout Agt. (1)	Total	Labor	Supervision					
				Scouts				Dist. Agts. (1)	
0	11	11							
				\$119.01		\$119.01	0.018		
172	285	457		\$562.40	0	3205.31	\$20.65	3788.36	0.029
172	296	468		\$562.40	0	\$3324.32	\$20.65	\$3907.37	0.029

- (1) Private land 12051 Ribes pulled) no date available on acreage worked by P. W. A.
Forest-Service land 450 Ribes pulled) on National Forests or State land.
State land 8 Ribes pulled) This work was incidental to that on private land.
Total 12509 Ribes pulled) adjoining.
- (2) Includes State leaders in Georgia & South Carolina.

20 Counties containing white pine.

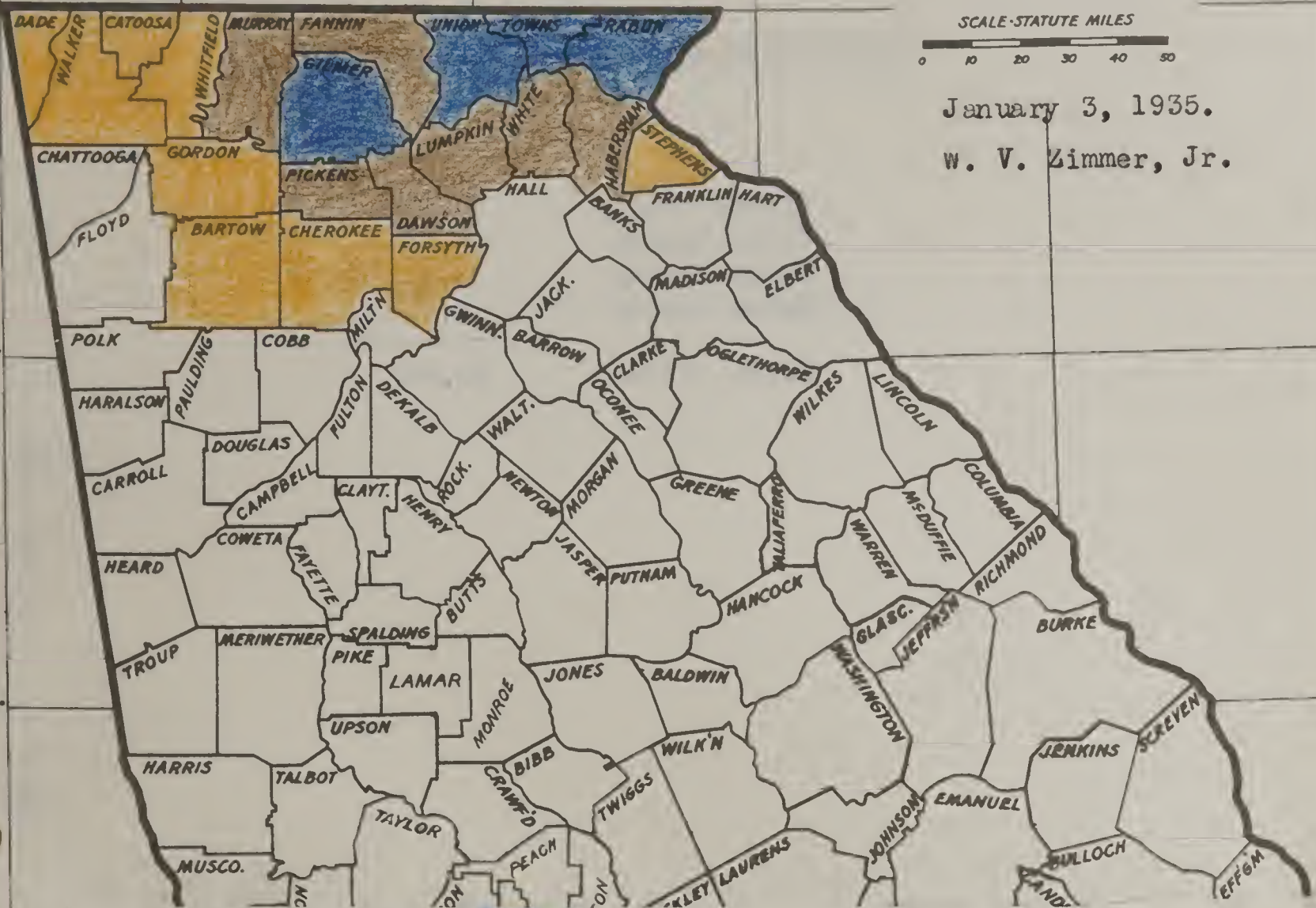
GEORGIA

SCALE-STATUTE MILES

0 10 20 30 40 50

January 3, 1935.

W. V. Zimmer, Jr.



COUNTIES WORKED (BLUE)

COUNTIES TO BE WORKED (IMPORTANT) (BROWN)

COUNTIES TO BE WORKED (SECONDARY) (ORANGE) (GILMER 3,476)

RIBES ERADICATED 12,509. (RABUN 4,956) (TOWNS 2,726) (UNION 1,351)

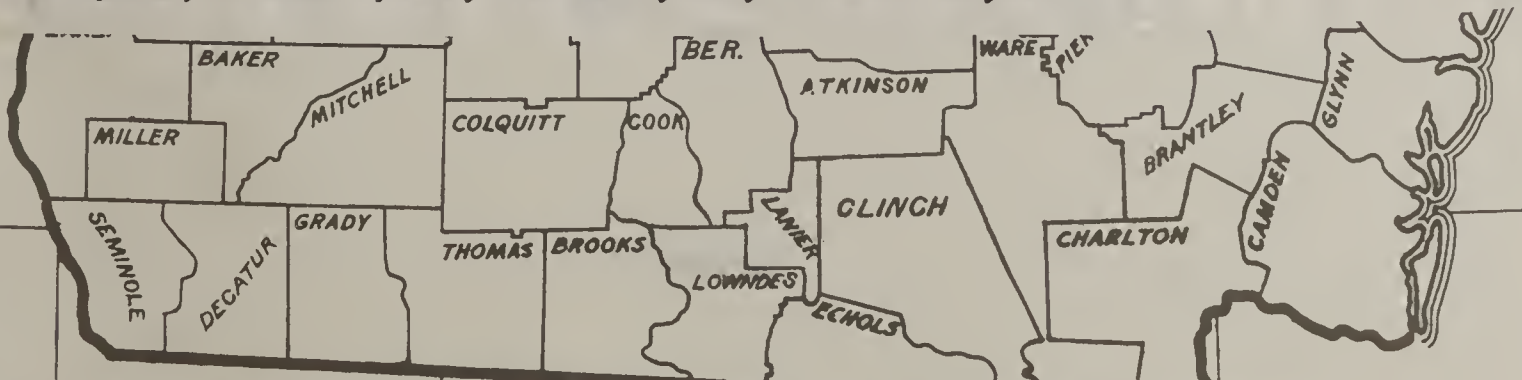
RIBES LOCATED 1,812. (RABUN 528) (TOWNS 215) (UNION 87) (GILMER 982)

RIBES ERADICATED NO. PLACES (297) (RABUN 80) (TOWNS 77) (UNION 41) (GILMER 99)

RIBES LOCATED NO. PLACES (93) (RABUN 48) (TOWNS 5) (UNION 8) (GILMER 32)

WHITE PINE ACREAGE (ESTIMATE) 44,240

RABUN 8,800, TOWNS 2,640, UNION 6,240, GILMER 26,560.



BLUE: Counties that have been worked 12,509 Ribes eradicated.

BROWN: Counties containing the best stand of pine and not worked; most important for coming eradication season.

ORANGE: Counties secondary in pine acreage to be worked.

RIBES ERADICATED TO DATE JANUARY 6, 1935.

Gilmer County	3,476
Towns County	2,726
Union County	1,351
Rabun County	4,956
	<hr/>
TOTAL RIBES:	12,509

(OVER)

K E N T U C K Y

ANNUAL REPORT OF WHITE PINE BLISTER RUST CONTROL WORK
IN KENTUCKY---1934.

ACKNOWLEDGMENT

The writer wishes to extend his sincere thanks and appreciation to the Blister Rust personnel for the efficient service rendered during the 1934 season. He, also, wishes to acknowledge the helpful guidance and advice of Mr. Roy G. Pierce, and the State cooperating officials, Mr. K. G. McConnell, State Forester; and Prof. W. A. Price, State Entomologist, and Mr. W.E. Jackson, Jr. former State Forester.

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF ENTOMOLOGY
AND PLANT QUARANTINE, THE KENTUCKY FOREST SERVICE, and the
KENTUCKY STATE ENTOMOLOGIST.

Cooperative Work in Controlling White Pine
Blister Rust in Kentucky.

- - - - -

The object of the cooperative work outlined herein is to provide for scouting and inspection for the white pine blister rust in Kentucky, and for the application of such methods of eradication or control as may be necessary.

A. The United States Department of Agriculture, Bureau of Entomology and Plant Quarantine Agrees:

- (1) To pay the salaries and necessary travel expenses of one or more men for such time as may be necessary to determine the occurrence and limits of the spread of this disease in Kentucky, and under the authority of the Kentucky Forest Service and its cooperators shall cooperate in the eradication of the disease wherever found.
- (2) To assume responsibility for technical instruction of employees engaged in these investigations.
- (3) To conduct such experiments and demonstrations as may be desirable for the purpose of securing effective control of the white pine blister rust in Kentucky.

B. The Kentucky Forest Service Agrees:

- (1) To assume the administrative direction of the aforesaid employees of the United States Bureau of Entomology and Plant Quarantine.
- (2) To conduct such control activities as may be agreed upon each year by the cooperating parties
- (3) To prepare an annual report of all blister rust control work performed under the provisions of this memorandum, one copy of which will be delivered to each of the cooperating parties.
- (4) To submit in prescribed form to the United States Bureau of Entomology and Plant Quarantine a monthly report of salaries and expenses paid by the State in blister rust control work.

- (5) To have all salary and expense vouchers of temporary employees to be paid out of Federal funds approved by the individual directly in charge of supervising cooperative blister rust control work in the State before being submitted to the United States Bureau of Entomology and Plant Quarantine for payment. This individual shall be under appointment as collaborator without compensation in the United States Department of Agriculture. All Federal funds expended in connection with this cooperative work shall be disbursed in accordance with the fiscal regulations of the United States Department of Agriculture.

C. The Kentucky State Entomologist Agrees:

- (1) To conduct such survey and control activities as may be agreed upon each year by the cooperating parties.
- (2) To undertake such destruction of white pines or Ribes in Kentucky and such enforcement of State laws as may be necessary for the effective prosecution of blister rust control work.

To deputize and authorize the aforesaid employees of the United States Bureau of Entomology and Plant Quarantine to destroy such pines, currants and gooseberries as may be necessary and as provided for by the State laws.

D. It is Mutually Agreed:

- (1) That the details of this cooperative work shall be planned and executed jointly by the Bureau of Entomology and Plant Quarantine through its Division of Plant Disease Control, the Kentucky Forest Service and the Kentucky State Entomologist.
- (2) That this memorandum of understanding shall take effect July 1, 1933, and continue in effect until June 30, 1935, provided, that either party may terminate the agreement at any time by a written statement to that effect 30 days in advance of the date of termination desired.

- (3) That all persons appointed by the United States Bureau of Entomology and Plant Quarantine and its cooperators under this memorandum shall be satisfactory to the cooperating parties.
- (4) That the results of the cooperative work may be published jointly, or upon mutual agreement by either cooperating party, with due credit given to the cooperating agencies. All manuscripts therefor, shall be criticised by the cooperating parties before publication and all form letters, bulletins and any other circulars to be mailed in penalty envelopes shall be submitted in manuscript form for approval by the United States Department of Agriculture before being printed or sent out, in accordance with Postal Law.
- (5) That any expenditures involved in the work herein assumed by the United States Bureau of Entomology and Plant Quarantine are contingent upon appropriations made by Congress for continuance of these activities, but no Federal funds shall be expended in compensation for host plants destroyed in control work.
- (6) That for the fiscal term July 1, 1933, to June 30, 1935, the Kentucky Forest Service and its cooperators will expend about \$300.00 and the Federal Government in behalf of the United States Bureau of Entomology and Plant Quarantine about \$9,200 in connection with the work herein provided for, provided, however, that the maximum expended by the Federal Government shall not exceed \$10,000.

FOREWORD

The control of white pine blister rust was carried on in Kentucky on a cooperative plan between the United States Department of Agriculture - Bureau of Entomology and Plant Quarantine, the Kentucky Forest Service, and the Kentucky State Entomologist. We operated in the State under a special regulation of the Kentucky Nursery Inspection Law enacted by the regular session of the General assembly in 1926.

PERSONNEL

Kentucky is included in the Southern Appalachian Region, and all control work was carried on under the direction of Mr. Roy G. Pierce, Associate Pathologist of the Bureau of Entomology and Plant Quarantine, with offices in Washington, D.C.

Our cooperators are, the State Forester K. G. McConnell, who assumed the administrative direction of the work, and Prof. W.A. Price State Entomologist, who conducted control activities, and the enforcement of laws that were necessary for the effective prosecution of blister rust control work.

The blister rust control force consisted of the following men:-

1. L.W. Brown - State Leader- headquarters at Winchester, Ky.
2. R.F. Allison - Agent - headquarters at Winchester, Ky.
3. J.J. Rosenberg - Agent - headquarters at Winchester, Ky.

In addition to a State leader and two full time agents, a temporary agent, Mr. Charles G. Clark, was engaged for a period of 30 days. All labor was obtained from the unemployed in the counties in which the work was being carried on. This was done through the local representatives of the National reemployment service.

WHITE PINE IN KENTUCKY

The total acreage of white pine in Kentucky comprises 26,372 acres (5% or better) which lies in six adjoining counties in Eastern Kentucky. The following table shows the distribution by counties:

1. Wolfe	-	22,003	acres
2. Powell	-	2,265	"
3. Menifee	-	1,314	"
4. Morgan	-	409	"
5. Lee	-	351	"
6. Magoffin	-	30	"

In addition to the above figures, these six counties contain large areas of scattered pine (less than 5%) the acreage of which we can give no accurate estimate.

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As the previous table indicates, Wolfe county lies in the heart of the white pine belt of Kentucky. The remaining five counties each contain pine only in that portion of the county which borders Wolfe. Practically all of the white pine in Wolfe county is second growth, there being very little virgin timber left. This second growth timber is of the cove type, preferring the hollows along the water courses where the soil is deeper and richer, and where the moisture requirements are more favorable. Where pine is found on the shallow sandy soil of the ridges, the annual growth is reduced to a noticeable extent, and the trees lack the deep bluish green color which is so characteristic of the species.

The white pine in Powell and Lee counties, although not as abundant as in Wolfe, is of practically the same type, being found in the deep canyons along the streams with considerable young growth coming in on the ridges.

According to Agent Rosenberg, most of the white pine in Meniffee and Morgan counties is found above the cliffs, and along the ridges. This is probably due to differences of soil conditions, and to the dense ceiling afforded by the hardwoods below the cliffs. Morgan county may be classified as a better farming section than any of the other pine counties, and white pine is found on the gentle slopes usually growing on a western exposure.

The soil on which we find white pine throughout Kentucky ranges from a sand to a sandy loam, and in many instances, unusually good growth has been noted. On the Maxey farm at Ezel, Kentucky, pine has made a very remarkable growth, having attained a height of 80 feet, with an average annual growth of about 3 feet, and an average age of about 55 years.

The replacement of dead stands of chestnut by white pine is a very interesting phase of silviculture. On several occasions this pine has been observed coming in three to four hundred trees per acre under dead chestnut, which affords the proper light and greatly reduces the hardwood competition.

Fire, especially in Wolfe county, has done no great damage in the past few years, and with the introduction of the CCC camps into this section of the State, the hazards have been reduced even more. Conditions seem very favorable for the growth of white pine, and there is every reason to believe that the present stands will reach maturity.

TABLE SHOWING ROUGH ESTIMATE OF SCATTERED
WHITE PINE BY COUNTIES.

1. Wolfe	30,000
2. Meniffee	3,200
3. Powell	1,500
4. Morgan	600
5. Lee	550
6. Magoffin	<u>None</u>

Total 35,850

There are in Kentucky 10,500,000 acres of land which is suitable for nothing except the growing of timber. Approximately fifty per cent of this land or 5,000,000 acres lies in the mountainous counties east of a line drawn from Lewis to McCreary County. Most of our coniferous trees are found in this rough section of the State and white pine is one of the most valuable for the production of high grade lumber.

Very little merchantable white pine is left, but we know that at one time it was a species of vast importance in eastern Kentucky producing the highest type of product. In years to come, the timberlands of Kentucky, if properly managed, could produce good stands of white pine since it is naturally adapted to soil and climatic conditions in the mountain coves.

The following table shows the annual production of white pine in Kentucky and the number of mills reporting 1899 to 1930:

<u>Year</u>	<u>White pine cut M feet B.M.</u>	<u>No. of mills</u>
1899	3,940	1232
1904	500	825
1905	5,505	426
1906	10,717	991
1907	13,167	1451
1908	3,882	1530
1909	4,606	2372
1910	3,399	1660
1911	1,245	1452
1912	1,506	1386
1913	1,151	1061
1914	1,299	1281
1915	5,896	616
1916	6,363	597
1917	2,121	579
1918	3,299	464
1919	3,575	1224
1920	2,498	558
1921	1,934	463
1922	772	339
1923	1,369	349
1924	1,621	345
1925	3,849	401
1926	3,590	431
1927	1,572	375
1928	1,555	331
1929	2,491	836
1930	674	599

Table showing percentage of white pine used by various industries.*

<u>Industry</u>	<u>% White pine used.</u>
Sash, doors & planing mill products	45.9
Boxes	16.2
Coffins & Caskets	13.2
Trunks	10.8
Tanks	6.6
Musical instruments	3.8
Farm implements	1.2
vehicles	2.0

It is interesting to note that of the 7,573,000 feet of white pine being consumed annually in Kentucky only 1.8 percent is grown in the State.*

*Figures taken from "Wood-Using Industries of Kentucky" published by Kentucky Department of Agriculture, Forestry and Immigration 1908.

NURSERIES GROWING WHITE PINE

After a survey, made by Prof. W.A. Price, State Entomologist, of the nurseries in the state, only the following were found to grow pinus strobus.

1. Donaldson Nurseries, Sparta, Ky.
200 Pinus strobus.
2. Bourbon Nurseries, Paris, Ky.
300 - 400 Pinus strobus.
3. State Nursery at Fair Grounds, Louisville, Ky.

RIBES

Cultivated gooseberries (Ribes grossularia) are found fairly well distributed throughout the counties in which work was carried on. Approximately 50% of the farmers grew gooseberries in the garden for household use. Very few cultivated currants were found.

The following is a list of the gooseberry growers other than those listed on the pine area sheets, and all lie within the protective zone of pine stands:

WOLFE COUNTY

						No. <u>bushes</u>
1.	Adam Creech, Valaria, Ky.	---	Cultivated Ribes	(Gooseberries)		27
2.	Elmer Likens, " "	" "	" "	" "		20
3.	Kelley Banks, Calaboose, Ky.	" "	" "	" "		16
4.	Leonard Falkner " "	" "	" "	" "		10
5.	Bunny Watkins " "	" "	" "	(Currants)		20
6.	Boone Brewer, Campton, Ky.	" "	" "	" "		5
7.	Samp Taylor (Near R.R. Quillan pine area H-29)			" "		1
8.	Thomas Booth, Fincastle, Ky.	" "	" "	(Gooseberries)		1
9.	Green Gentry, Grannie, Ky.	" "	" "	" "		5
10.	G.W. Wilhoit " "	" "	" "	" "		4
11.	Dora Hobbs, " "	" "	" "	" "		1
12.	John Barker, Stillwater, Ky.	" "	" "	" "		8
13.	John Barker " "	" "	" "	(Currants)		5
14.	Wheeler Roberts " "	" "	" "	(Gooseberries)		15
15.	Dock Hollan " "	" "	" "	" "		4
16.	J.J. Adams " "	" "	" "	" "		4
17.	Alice Creech, Campton,	" "	" "	" "		2
18.	" " " "	" "	" "	(Currants)		1
19.	Bert Chester, Torrent, KY.	" "	" "	(Gooseberries)		8
20.	Crit Cable, Zachariah, Ky.	" "	" "	" "		18
21.	Field Bush " "	" "	" "	" "		42
22.	Willie Booth, Fincastle, Ky.	" "	" "	" "		8
23.	W.L. Bush Heirs, Torrent, Ky.	" "	" "	" "		18
24.	" " " "	" "	" "	" "		30

(2 houses)

WOLFE COUNTY(Cont'd)

					No. Bushes
25. Bob Kincade, Torrent, Ky.	Cultivated	Ribes	(gooseberries)		7
26. Newt Townsend "	"	"	"	"	59
27. Jim Henry Elam, Mill Creek, Ky	"	"	"	"	9
28. Kelley Brewer, Rogers, Ky.	"	"	"	"	4
29. Mat Hudson, Graining Block Fork	"	"	"	"	30
30. Leonard Miller, Rogers, Ky.	"	"	"	"	4
31. George Spencer, Glencairne, Ky.	"	"	"	"	4
Total					<u>390</u>

MORGAN COUNTY

1. Jessey Craft, Artville, Ky.	Cultivated	Ribes	(Gooseberries)		1
2. Bill Lovely, Ezel, Ky.	"	"	"	"	1
3. Sam Collingsworth, Ezel, Ky.	"	"	"	"	Several
4. Bob Motley, Ezel, Ky.	"	"	"	"	"
5. Millard Dennis, Ezel, Ky.	"	"	"	"	7
6. Roscoe Sexton, Ebon, Ky.	"	"	"	"	7
7. Jim Johnson, Dan, Ky.	"	"	"	"	20
8. Alex Maxey, Ezel, Ky.	"	"	"	"	10
9. Woody Culls, Ezel, Ky.	"	"	"	"	3
10. Ed Claypook. "	"	"	"	"	25
11. Boyd Anderson "	"	"	"	"	15
12. Joe Carpenter "	"	"	"	"	6
13. Arthur Riggsby, Zag, Ky.	"	"	"	"	5
Total					<u>100</u>

MENIFEE COUNTY

1. Geo. H. Wells, Mariba, Ky.	Cultivated	Ribes	(Red currants)		2
2. E.L. Smallwood, Mariba, Ky.	"	"	(gooseberries)		4
3. Clyde Clayborne "	"	"	(Both)		53
4. Bruce Northcutt "	"	"	(Gooseberries)		4
5. Wick Loudon, Frenchburg, Ky.	"	"	"	"	2
6. Sam Bowman, "	"	"	"	"	5
7. Marion Brown "	"	"	"	"	1
8. Jim Sorrell "	"	"	"	"	10
9. Estill Hole, "	"	"	"	"	4
10. Oliver Helton "	"	"	"	"	5
11. Bill Lawson "	"	"	"	"	5
12. Tom Helton "	"	"	"	"	3
13. John Rupe "	"	"	"	(Currants)	1
14. Mary Jane Ratliff "	"	"	"	(Gooseberries)	6
15. Wm. Wagers "	"	"	"	"	3
16. John Backs "	"	"	"	"	2
17. Bob Sexont "	"	"	"	"	2
18. Sam Griggs "	"	"	"	"	2
19. Butler Rothwell "	"	"	"	"	18
20. Rollar Fletcher "	"	"	"	"	18
21. Lizzie Lawson "	"	"	"	"	30
22. Henry Crane "	"	"	"	"	18
23. Henry McCoy "	"	"	"	"	5
24. Clay Robinson "	"	"	"	"	4
25. Jim Murphy "	"	"	"	"	12
Total					<u>219</u>

Grand total Wolfe, Morgan and Meniffee Cos 709

List of Ribes growers as found on the pine area sheets as follows:

The following is a list of Ribes growers as found on the pine area record sheets:

WOLFE COUNTY

No. of Sheet	Owner	Address	Ribes wild	Present Cult.	No. bushes pulled
A-4	Floyd Day Tract	Winchester, Ky	1916		1916
B-19	Daniel Johnson	Pine Ridge, Ky		2	
C-4	Jim Brewer	Calaboose, Ky.		10	
C-6	Taylor Brown	" "		40	
C-8	Erwin Taulbee	Campton, Ky.		10	
C-9	Barbara Campbell	" "		125	
C-11	Allie King	Beattyville, Ky.		10	
C-12	The Mays Farm	Campton, Ky.		20	
C-14	Sam Russell	Calaboose, Ky.		25	
C-15	Wess Peyton	" "		30	
C-17	Dock Williams	" "		200	
C-22	Mrs. Carl Brashears	" "		120	
C-23	Shad Banks	" "		150	
C-24	Floyd Brashears	" "		10	
C-26	Curt King Heirs	" "		50	
C-30	J.T. Spencer	" "		20	
C-32	Henry Center	" "		100	
C-34	B.R. Quillan & Heirs	Campton, Ky.		7	
C-35	Alex Taulbee	" "		120	
C-36	Mrs. L.C. Tolson	" "		8	
C-37	J.C. Watkins	" "		300	
C-38	Mort Barker	" "		1	
C-41	Cud Harton	" "		25	
C-44	Floyd Center	Calaboose, Ky.		20	
C-50	J.B. Wireman	" "		18	
C-52	Sam Banks	" "		12	
C-53	Dan Center Farm	" "		10	
C-60	Lenard Falkner	" "		25	
C-62	Charlie Pelfrey	" "		12	
C-64	Floyd Rose	" "		200	
C-70	Thomas Ratliff	Stillwater, Ky.		12	
C-76	Courtney Rose	Campton, Ky.		25	
C-78	C.B. Rose	" "		40	
C-85	Taylor Centers	Stillwater, Ky.		18	
C-88	Evans Heirs	Campton, Ky.		12	
D-2	Mrs. Ida Chester	Valaria, Ky.		7	
D-3	Dorsey Likens	" "		13	
D-5	Dewey Culbertson	" "		50	
D-12	Sim Lawson	" "		6	
D-13	Ely & Jim Culbertson	" "		28	
D-15	Shiloh Swango	" "		300	

WOLF COUNTY

No. of Sheet	Owner	Address	Ribes wild	Present Cult.	No. bushes pulled
D-19	Taylor Brewer	Valaria, Ky.		100	
E-7	Porter Clark	Gosneyville, Ky.	10	15	10
E-8	Joe & B. Crane	Toliver, Ky.		50	50
E-19	Sherman Shackelford	Gosneyville, Ky.		6	
E-22	Cudd Clark	" "		3	
E-29	Eddie McLaughlin	Trent, Ky.		5	
#-31	Herman Tyra & Boone Tyra	Stillwater, Ky.		2	
G-8	W.L. Bush Heirs	Torrent, Ky.		19	
G-9	V.T. Chapman	Jackson, Ky.		3	
G-13	Jasper Creech	Pine Ridge, Ky.		4	
H-24	W.D. Carroll	Torrent, Ky.		3	
H-27	Mike Carroll	" "		17	
H-32	Luther Whisman	Campton, Ky.		1	
H-41	Ceasar Hurst	Lexington, Ky.		26	26
H-43	Laura Booth	Fincastle, Ky.		13	
H-48	Susie Whisman	" "		1	
H-52	Jack Legg Heirs	Torrent, Ky.		11	
H-54	Green King	" "		3	
I-10	Frank Alexander	Campton, Ky.		25	
I-12	Lizzie Cable	" "		8	
I-14	James Roberts	" "		12	
I-17	William Perry	" "		20	
I-19	Robert McCoun	Vortex, Ky.		250	
I-20	Clifton Cable	" "		4	
I-21	R.H. Taulbee	" "		30	
				<u>2822</u>	

MORGAN COUNTY

50	Sam Collingsworth	Ezel, Ky.	8
53	Emizra Smith	Artville, Ky.	1
54	Jim Johnson		21
56	Alex Maxey	Ezel, Ky.	10
57	Tom Nannin	Dan, Ky.	1
58	Luther & Ed Claypool	Ezel, Ky.	25
			<u>66</u>

MENIFEE COUNTY

1	Geo. H. Wells	Mariba, Ky.	2
16	R.A. Day	" "	53
24	Bill Bowman	Pomeroyton, Ky.	5
			<u>60</u>

MENIFEE COUNTY

No. of sheet	Owner	Address	Ribes present		No. bushes pulled
			Wild	Cult.	
25	Wick Landern	Pomeroyton, Ky.		2	
28	Marion Brown	" "		1	
29	Bob Cox	" "		3	
30	Marion Brown	" "		1	
31	Jim Sorrell	" "		10	
32	Estill Hale	" "		4	
33	Oliver Helton	" "		5	
38	John Rupe	Wellington, Ky.		1	
42	William Wagner	Scranton, Ky.		3	
45	John Back	Korea, Ky.		2	
				<hr/>	
				Total	92

LEE COUNTY

5	B.W. Hill	Primrose, Ky.	160
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There were certain duplicated names and places in the above list as follows:

Meniffee County 4 places 14 bushes
Morgan " 4 " 55 "

Subtract these duplicated names and there remains the following number of persons having cultivated gooseberries/or currants:

Wolfe County	97 places	3212 bushes
Morgan "	15 "	11 "
Meniffee "	34 "	787 "
Lee "	1 "	160 "
	<hr/> 147 "	<hr/> 4270 "

Wild Ribes (Ribes cynosbati) were found in the following places in Wolfe County:

- | | |
|-------------------------------------|---------------------|
| 1. Floyd Day Tract, Pine Ridge, Ky. | Chimney Top Hollow. |
| 2. Thomas Booth, | Fincastle, Ky. |
| 3. Porter Clark, | Gosneyville, Ky. |

Wild Ribes were found to be almost lacking in the white pine section of Kentucky. Ribes cynosbati was found in three different locations in Wolfe county, with a total of 2095 bushes being eradicated.

It is rather difficult to draw any definite conclusions regarding the ecology of Ribes when so few were found in the state. However, we can say that the Ribes of Kentucky are found strictly associated with the limestone areas, and were found growing in the limestone cliffs on very moist and shady sites.

LIST OF NURSERIES GROWING RIBES

Only two nurseries in the State were found to be growing Ribes. These are as follows:

1. Pullam and Threlkeld Nursery, Clay, Ky.

100 gooseberries.

2. Robert R. Robbins Nursery, Union, Ky.

A few currants and gooseberries.

WHITE PINE BLISTER RUST

What it is

The white pine blister rust is a disease very destructive to white pine, and is caused by the fungus *Cronartium ribicola*. It enters the needles of the tree and works into the branches and trunk, forming cankers. These cankers are not easily distinguished until after the tree has been infected for a period of three or four years, at which time the bark becomes swollen in the vicinity of the canker, and a yellowish discoloration can be noticed. The disease cannot spread from one pine to another, but must live during part of its life cycle on the leaves of Ribes, (gooseberries and currants). Several stages of spore production take place, but those produced in the fall on Ribes are the ones capable of infecting pine. These spores, however, are delicate and short-lived, and their infecting range is limited to a short distance, which makes possible the control of the disease by destroying all Ribes within and surrounding the pine areas.

History

The first infection of white pine blister rust in North America was found in 1905 in a nursery near Philadelphia. Other investigations have indicated that it was introduced into Maine as early as 1897 on European black currants imported from England. However, more important introductions occurred during the period 1900 to 1910 as the result of importations of *Pinus strobus* from European nurseries. This diseased stock was planted in more than 200 locations in the northeastern States, and since has spread, through the medium of Ribes, over most of the natural range of white pine.

Status in Kentucky

To date no blister rust has been found in Kentucky, and we feel sure that it is not present. All the known white pine areas of value have been thoroughly scouted, and no disease reported, but there are a few counties in which reconnaissance work is yet to be done for the purpose of locating pine stands.

Control Work Done in State Before 1934

Very little work has been done in Kentucky prior to 1934. The following is a summary of the 1918 and 1919 surveys taken from the annual reports for the respective years.

SUMMARY

BLISTER RUST WORK IN KENTUCKY

1918

The work in Kentucky was carried out by Prof. F.T. McFarland, of the University of Kentucky, with one assistant. Sixty days (for 1 man) were spent in inspection work. The cost amounted to \$325.39 prior to July 1, and to \$290.08 since July 1; the total expenditure for the year being \$615.47.

Sixty-five inspections were made in the State, and white pines were found and examined at 52 places. No blister rust has been found on pine or Ribes in Kentucky.

Practically all of the known white pine plantings in the State have come from nurseries which have had the white pine blister rust, or which have received stock from other infected nurseries, and it is for that reason that these trees are inspected annually for the disease.

Kentucky has placed no quarantine for the blister rust since the State Entomologist, as yet, does not have this power.

SUMMARY

BLISTER RUST WORK IN KENTUCKY

1919

No. of places where blister rust was found - - - - -	0
No. of scouts engaged in work - - - - -	2
No. of man days spent in scouting - - - - -	39
No. of inspections made of planted white pine and cultivated Ribes - - - - -	44(7 in 1918 not reinspected in 1919)
No. of planted white pines examined - - - - -	2835
No. of cultivated Ribes examined - - - - -	Several hundred
No. of places where cultivated Ribes were examined - - -	11
No. of nurseries handling white pines - - - - -	2

BLISTER RUST CONTROL IN 1934

Previous to 1934, no extensive control work has been done in Kentucky, due probably, to the lack of sufficient funds. However, with money made available under the National Industrial Recovery Act we were able to make a survey of the entire white pine section of the State for the purpose of determining whether or not the rust was present, and if so, to carry on the necessary control work. In addition, we gathered information concerning the abundance and distribution of pine and Ribes, and general growth and site conditions of each.

1. Spread of the Rust.

After scouting the entire white pine section of the State, we report that no disease is present either on pine or on Ribes.

2. Pine location and Preeradication Survey.

Since very little information was available on the location of pine in the state, and since no preeradication survey had been made previous to the 1934 control season, we were obliged to combine the eradication, and the preeradication surveys into one operation. We worked the State by counties, scouting the pine areas as they were located, and eradicating any Ribes that were present.

3. Local control

Local control consists of eradicating all Ribes within 900 feet of the pine area. So few Ribes (wild) were found in Kentucky that very little of this work was done. Only on one area was it necessary to use a crew for eradication purposes. Ribes found on other areas were pulled by the scouts.

The following summaries written by the district agents give a vivid, and condensed picture of the work done in 1934.

SUMMARY OF WOLFE AND POWELL COUNTIES - BY. R. F. ALLISON

During the three and one-half month period that the work was in progress, all of Wolfe County, and the white pine area of Powell County, was scouted for Ribes and white pine. The acreage summary is as follows:

	<u>Pine and protective zone</u>	<u>5% (or above) white pine</u>
Wolfe County - - - - -	44,246 acres	22,003 acres
Powell " - - - - -	4,725 "	2,265 "
Total	48,971 "	24,268 "

To assist the agent in scouting the two counties, nineteen laborers were employed, the labor hours for the two counties, totaling 3,647 hours 168 hours in Powell County, and 3,479 hours in Wolfe. Fifteen men were given employment in Wolfe, and four in Powell.

Wolfe County might be characterized as a white pine area - really it is the heart of the white pine belt of Kentucky. With the exception of the eastern "third" of the county, the white pine is found generally throughout the rest of the county, and in the extreme eastern portion of Powell county. The white pine in this section might be characterised in several ways:

Over ninety-five percent of the white pine is second growth, there being very little virgin pine left in Kentucky. The major portion of this second growth is between fifteen and thirty years old, the lesser portion being under fifteen years of age. This is an approximation of course.

By far, the greater part of the pine is found in coves, hollows, and along the various water courses - very little pine is found on the ridges. It seems to be naturally adapted to moist locations where the soil is deeper and richer in the plant nutrients. Little pine is found on thin land, but where it is found growing on such land, the annual growth usually is noticably less than that of pine growing where the moisture and soil requirements are more favorable. Pine growing on good sites has the characteristic dark, bluish-green foliage, so easily distinguished from other pines, while that pine growing on thin land lacks this vigorous shade of green, and is lighter in color, and is less easily distinguished from other species of pine.

As the chestnut timber dies out and disappears from the forests of Kentucky (another decade will witness this reality) there is every reason to believe that it will be replaced by the white pine in the pine section. It is commonplace to find a half dozen or more young white pine seedlings springing up in the place where a chestnut has died. The holes in the "ceiling of the hardwood forest" caused by the passing of a mighty race of trees, admits the necessary light in which the white pine thrives, and which is essential to its growth and life.

Associated with the white pine in these counties is found a wealth of yellow poplar, which should prove an asset of great value in the future. Likewise, are found hemlock, yellow and black pine and oaks in great abundance. Maple, beech, hickory, walnuts, and some linden and elm are also to be found, but they are of minor importance. White pine and yellow poplar stand predominately at the head of the list of timber trees in this section.

No white pine blister rust was observed in this section. Wild *Ribes-Ribes cynosbati* - were found in the Chimney Top Hollow. These seemed to be closely associated with the limestone area, as they were found only in limestone cliffs and boulders, growing in sites where the shade was very dense and the moisture conditions optimum. A total of 2095 bushes were eradicated. Considerable cultivated *Ribes*, mainly the garden gooseberries, were located and notations to this effect were made on the pine area sheets.

Very little other damage by disease and insect injury was noted. There is some damage to the pitch pine from the pine-tip moth and some pales weevil damage to the white pine. Little of either was to be seen. In the Sandy Ridge Fork of the Red River in Powell County a number of hemlocks were noticed to be dead or dying from no apparent cause. Fine, large trees were, in many cases, already dead, and many others showed a decided yellowing of the needles, an unnatural situation for this time of year.

Very little forest fire damage was found in either county- but where fire had been in previous years, the pine was usually all killed out and only a scrub growth left to take its place. The Veteran's C.C.C. Camp (F-1) at Pine Ridge, is doing a fine piece of work to help make the forests of Wolfe county safer from the ravages of fire, by building fire lanes and good roads down the ridges to facilitate the rapid transportation of men and fire fighting apparatus. Likewise the C.C.C. Camp at Natural Bridge has reduced the fire hazard in the Park by cleaning up the dead and fallen trees and underbrush throughout the area

With continued and greater care and attention, the white pine areas of Eastern Kentucky will again come into their own, as well as the other important timber trees of that section. With Federal and State agencies cooperating, future generations of Kentuckians will be assured that supply of productive and valuable timber that is their right.

SUMMARY OF MENIFEE AND MORGAN COUNTIES

By J.J. Rosenberg

During the 1934 control season in Kentucky 10,574 acres of land were scouted in Meniffee and Morgan counties, of which 1,723 acres ran 5% or better of white pine. The pine areas of this district were very small, hence, the ratio of protective zone to actual pine area is rather large.

Nine local men were employed in this district to assist in scouting and were obtained through the National Reemployment agency.

No wild Ribes were found in either county, and the only eradication work performed was at abandoned home sites where cultivated bushes were found.

In Morgan county most of the pine was found above the cliffs, and along the ridges. This fact indicates that white pine does very well in the sun, but exceedingly good growth has also been noted on shady sites. The best and largest quantity of pine grew in sandy to sandy loam soil at elevations of 1000 to 1200 feet, and was found to do best on a western exposure.

Morgan county is a much better farming section than any of the other white pine counties, due primarily to the difference of topography. Pine is not abundant, but where present is found on the gentle rolling slopes. The best stand of pine in the State is located in this county on the farm of Alex Maxy at Ezel, Kentucky.

Site conditions are very favorable for the growth of white pine in this district, but without adequate fire protection, the establishment of white pine stands will be very difficult.

SUMMARY OF LEE COUNTY - BY CHARLES G. CLARK

Scouting was carried on in Lee county for an approximate period of three weeks covering a total acreage of 1,978 acres, of which 381 acres ran 5% or better to pine. The pine areas of this county are scattered throughout the northeastern section and considerable difficulty was

encountered in locating them since very little information was obtainable from the natives.

The pine in Lee county, like most of the other counties, is of the cove type, being found along the streams under the cliffs. Large areas of scattered pine were noted, and with proper protection the outlook for future stands seems very promising.

Only two laborers were employed to assist in scouting.

No wild Ribes were located.

Table #1 - Showing Local Control by N.R.A. Labor for period
July 1 - October 15, 1934.

County	Acres pine protected	Acres worked	No. Ribes pulled	Man days labor
Wolfe	22,003	44,246	2,135	434.5
Powell	2,265	4,725	0	21.0
Meniffee	1,314	8,630	56	122.0
Morgan	409	1,944	74	25.5
Lee	351	1,798	1,660	18.0
Magoffin	30	180	0	2.0
*Rowan	0	0	0	2.0
Bath	0	0	0	1.0
Estill	0	0	0	1.0
Breathitt	0	0	0	1.0
Total	26,372	61,523	3,925	628.0

*Rowan, Bath, Estill and Breathitt are counties in which reconnaissance work was done and no pine found present.

Table #II - Showing Local Control Done by all Agencies

Agency	Acres pine protected	Acres worked	No. Ribes pulled	Man days labor
N.R.A.	26,372	61,523	3,925	628.0
E.C.W.	0	0	0	0
Private owners	0	0	0	0

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt$$
for $x \in \mathbb{R}$. It is shown that $f(x)$ is an odd function and that $f(x) \in (-\frac{\pi}{2}, \frac{\pi}{2})$ for all $x \in \mathbb{R}$. Moreover, $f(x)$ is strictly increasing and concave down on $(0, \infty)$ and strictly decreasing and concave up on $(-\infty, 0)$.

2. The second part of the paper is devoted to the study of the function $g(x)$ defined by the equation

$$g(x) = \int_0^x \frac{t}{1+t^2} dt$$

for $x \in \mathbb{R}$. It is shown that $g(x)$ is an even function and that $g(x) \in (-\frac{\pi}{4}, \frac{\pi}{4})$ for all $x \in \mathbb{R}$. Moreover, $g(x)$ is strictly increasing on $(0, \infty)$ and strictly decreasing on $(-\infty, 0)$.

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
0	0	0	1	0
1	$\frac{\pi}{4}$	$\frac{\pi}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
-1	$-\frac{\pi}{4}$	$\frac{\pi}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
2	$\frac{\pi}{2}$	$\frac{\pi}{2}$	$\frac{1}{5}$	$\frac{2}{5}$
-2	$-\frac{\pi}{2}$	$\frac{\pi}{2}$	$\frac{1}{5}$	$\frac{2}{5}$
3	$\frac{3\pi}{4}$	$\frac{3\pi}{8}$	$\frac{1}{10}$	$\frac{3}{10}$
-3	$-\frac{3\pi}{4}$	$\frac{3\pi}{8}$	$\frac{1}{10}$	$\frac{3}{10}$
4	$\frac{4\pi}{4}$	$\frac{4\pi}{4}$	$\frac{1}{17}$	$\frac{4}{17}$
-4	$-\frac{4\pi}{4}$	$\frac{4\pi}{4}$	$\frac{1}{17}$	$\frac{4}{17}$

3. The third part of the paper is devoted to the study of the function $h(x)$ defined by the equation $h(x) = \int_0^x \frac{1}{1+t^4} dt$ for $x \in \mathbb{R}$. It is shown that $h(x)$ is an odd function and that $h(x) \in (-\frac{\pi}{4}, \frac{\pi}{4})$ for all $x \in \mathbb{R}$. Moreover, $h(x)$ is strictly increasing and concave down on $(0, \infty)$ and strictly decreasing and concave up on $(-\infty, 0)$.

4. The fourth part of the paper is devoted to the study of the function $k(x)$ defined by the equation $k(x) = \int_0^x \frac{t}{1+t^4} dt$ for $x \in \mathbb{R}$. It is shown that $k(x)$ is an even function and that $k(x) \in (-\frac{\pi}{8}, \frac{\pi}{8})$ for all $x \in \mathbb{R}$. Moreover, $k(x)$ is strictly increasing on $(0, \infty)$ and strictly decreasing on $(-\infty, 0)$.

x	$h(x)$	$k(x)$	$h'(x)$	$k'(x)$
0	0	0	1	0
1	$\frac{\pi}{4}$	$\frac{\pi}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
-1	$-\frac{\pi}{4}$	$\frac{\pi}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
2	$\frac{\pi}{2}$	$\frac{\pi}{2}$	$\frac{1}{5}$	$\frac{2}{5}$
-2	$-\frac{\pi}{2}$	$\frac{\pi}{2}$	$\frac{1}{5}$	$\frac{2}{5}$
3	$\frac{3\pi}{4}$	$\frac{3\pi}{8}$	$\frac{1}{10}$	$\frac{3}{10}$
-3	$-\frac{3\pi}{4}$	$\frac{3\pi}{8}$	$\frac{1}{10}$	$\frac{3}{10}$
4	$\frac{4\pi}{4}$	$\frac{4\pi}{4}$	$\frac{1}{17}$	$\frac{4}{17}$
-4	$-\frac{4\pi}{4}$	$\frac{4\pi}{4}$	$\frac{1}{17}$	$\frac{4}{17}$

Table #III - Showing Ownership of Land Upon Which Local Control Work was Done.

Ownership	Source of Labor	Acres of pine protected	Acres worked	No. Ribes pulled	Man days labor
National Forest	0	0	0	0	0
National Park	0	0	0	0	0
State forest	0	0	0	0	0
State Parks	N.R.S.	335	800	0	0
Municipal	0	0	0	0	0
Private	N.R.S.	26,037	60,723	3,925	625
Total	N.R.S.	26,372	61,523	3,925	628

INFORMATION ACTIVITIES

No public demonstrations or lectures were made in Kentucky because we deemed it unnecessary since the disease is not present. All employees, however, were instructed to pass information concerning the rust to all individuals with whom they made contact. In addition, we circulated numerous pamphlets which described the disease, its effect, and control measures.

SUMMARY OF INFORMATIONAL ACTIVITIES

No. of contacts made	728
No. of publications distri.	135
No. of posters distributed	3
No. of letters sent to nurserymen	10
No. of items published newspaper	4
No. of individuals instructed	55

PLANS FOR 1935

There are no future plans for blister rust work in Kentucky. With the completion of the present program, we feel that there will be no more work necessary in the State for several years. We know that the disease is not present, and we have all the desirable information concerning the white pine present. Additional work would not be justified.

LEGISLATION

White pine blister rust control was carried on by authority of the State Entomologist under a special regulation of the nursery inspection law of 1926, which reads as follows:

Whereas there is prevalent in the United States a serious forest disease known as the white pine blister rust which has already spread to the adjoining states of Ohio, West Virginia, and Virginia, and which threatens the white pine forests of Kentucky; and whereas this disease is spread only through the intermediation of bushes of the genera Ribes and Grossularia,

hereafter referred to by their common names currants and gooseberries. Now, therefore, acting under the law and power invested in me, in order to safeguard our forests from the white pine blister rust. I have now designated, with the advice, counsel and consent of the Commissioner of Agriculture and the Director of the Kentucky Agricultural Experiment Station, certain counties as white pine-growing districts and may add to them as the need arises: viz. Menifee, Morgan, Powell and Wolfe. Within such pine-growing districts all wild currants and gooseberry bushes, and such cultivated bushes of these species located at abandoned or unoccupied houses, are declared a nuisance and same may be removed by duly authorized agents of this department, when growing within 1500 feet of valuable pine forests.

State Entomologist.

MISCELLANEOUS

One of the most difficult and time-requiring tasks was that of locating white pine stands in the State. Many of the roads are impassable, and in some areas there are no roads at all. This fact necessitated the hire of horses on several occasions, and in one instance we were obliged to work from a temporary camp which was established in the Red River section of Menifee county.

The equipment for the camp was furnished by the State Forest Service, and the only expenditures made were for provisions and for a team for transportation of equipment to and from the camp site. The following table shows the cost of camp, and the work accomplished:

Provisions	\$11.22
Transportation of Equip.	5.00
Cost of labor	74.25
Acreage of work	925
Total man hours	165
Total expenditure	90.47
Cost per acre	.097
Duration of camp	4 days

The writer feels that the costs of this camp were justified, since the agent's per diem and cost of transportation of laborers would offset the cost of the camp.

CONCLUSIONS

Although no disease is reported from Kentucky, we feel that a successful season's work has been completed. We have gathered valuable information concerning white pine and Ribes heretofore unknown in the State, and we feel these facts will be of benefit for future practice in forestry. Kentucky can be classified as a white pine growing state and there is no doubt concerning the value of the species for future reforestation purposes.

Since this seasons work, and the work of numerous botanists carried on in previous years, has shown the almost entire absence of wild Ribes in eastern Kentucky, and since white pine has been observed making very good growth, especially throughout Wolfe County, it is logical to conclude that the species should be used for planting purposes in that section of the State. There is very little to worry about concerning the white pine blister rust for a number of years. Work similar to that of this year will be done at intervals of from four to five years, and if the disease ever enters the State it will be kept well under control.

It seems very plausible that white pine should be used on extensive planting programs throughout the State. It is a tree of high commercial and esthetic value, a fast grower, and does well in the soils of medium quality which are found throughout eastern Kentucky.

LIST OF KNOWN WHITE PINE PLANTATIONS IN KENTUCKY - OVER 100 TREES

1. Quicksand, Ky. - CCC camp S 51
2. State Forest at Putney, Ky.
3. White and red pine mixed - 1 mile west of Ashland, Kentucky
on Route 60. Land owned by American Rolling Mill
Company of Ashland, Kentucky.
4. Girls Scout Camp at Louisville, Ky.
5. On Charles Vance property near Franklin,
Kentucky, in Simpson County.

The first part of the paper is devoted to a general discussion of the problem. It is shown that the problem is well-posed and that the solution exists and is unique. The second part of the paper is devoted to the construction of the solution. It is shown that the solution can be constructed by the method of successive approximations. The third part of the paper is devoted to the numerical solution of the problem. It is shown that the numerical solution can be obtained by the method of finite differences.

The fourth part of the paper is devoted to the stability of the solution. It is shown that the solution is stable with respect to the initial conditions and the data of the problem. The fifth part of the paper is devoted to the error analysis. It is shown that the error of the numerical solution is of the order of $O(h^2)$.

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D.A.C.-5B

U. S. DEPARTMENT OF AGRICULTURE
Division of Plant Disease Eradication

STATISTICAL REPORT OF RIBES ERADICATION WORK UNDER M.R.A.

State: Kentucky Year: 1934.

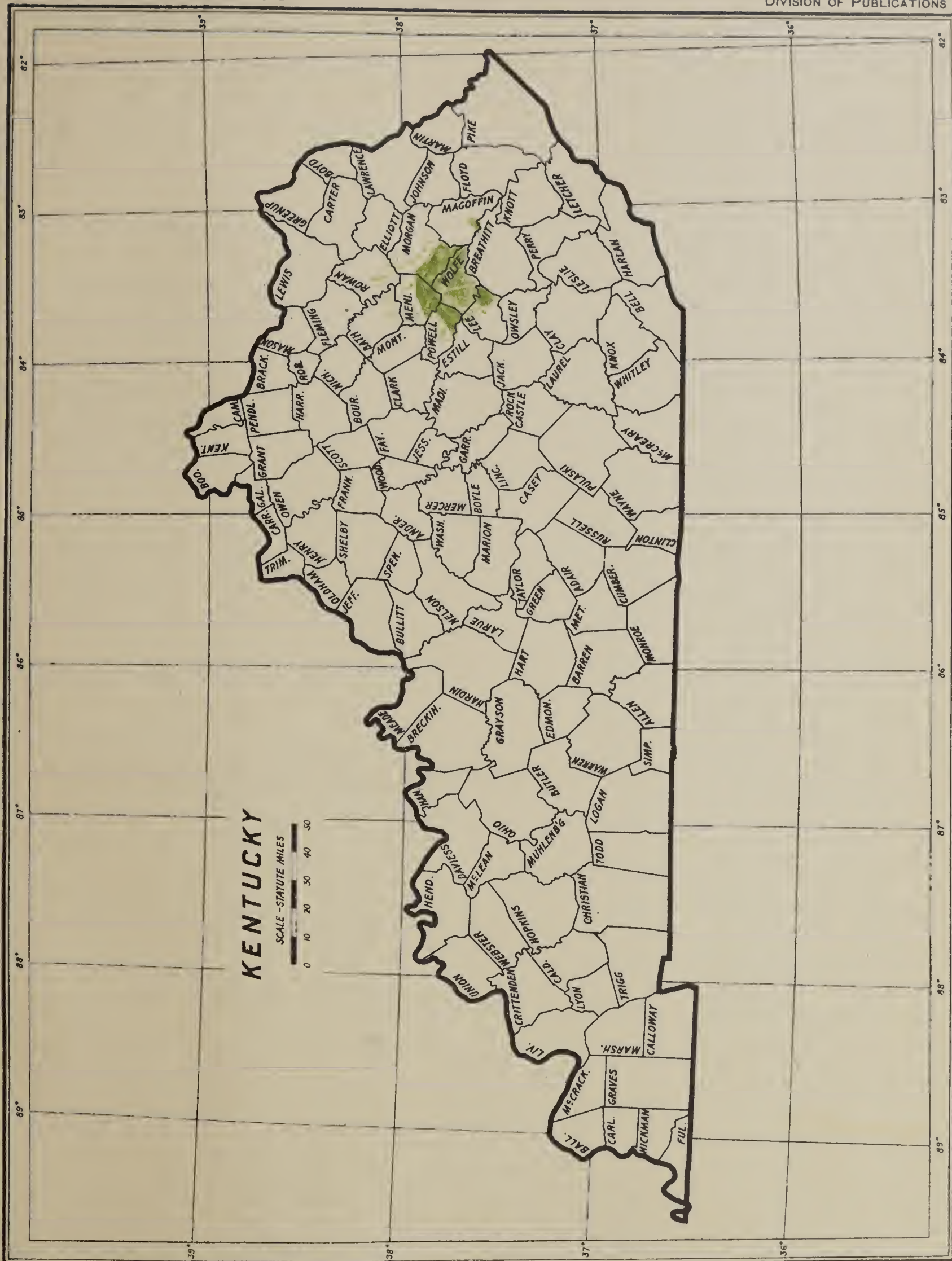
Name of District Agent		Rosenberg	Allison	Clark	Brown*	Totals for State	
No. towns worked		2	2	3	3	10	
Period work performed		6/18-10/10	6/18-10/10	8/27-9/25	6/18-10/10	37	
No. men employed		9	19	4	5		
Initial and Re-erad.	Total acreage worked	10,574	48,971	1,978	0	61,523	
	Acreage pine protected	1,723	24,268	381	0	26,372	
	Ribes Wild	0	2,095	0	0	2,095	
	Pulled Cult.	130	40	1,660	0	1,870	
	Total man hours*	1,180.5	3,647	137.5	59.25	5,024.25	
Initial and Re-erad.	Total cost of Gov't.	572.43	1,816.19	125.69	26.65	2,540.96	
	Ribes erad.	0	0	0	0	0.0	
	Total acreage worked						
	Acreage pine protected						
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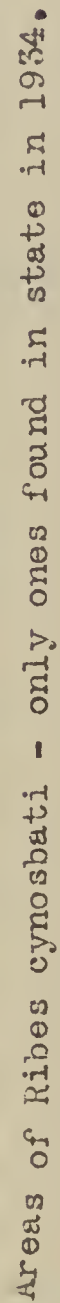
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White pine
Scattered white pine.



APPENDIX

Table 1. Local Control Result of Ribes Eradication, 1934 N.R.A.

First Eradication*																								
County in which work was performed	No. of projects	Acres white pine protected	Acres worked by			Ribes bushes pulled						Man days labor used			Man days super-vision state leader	Costs			Sup lies and Equipment	Per acre worked	Ownership			
			Crew	Scout	Total	Crew		Scout or Agent		Total	Ribes all	Ribes per acre	Crew	Scout or agent		Total	Labor	Scout				Dist. agents	State Leader	
						Wild	Cult	Wild	Cult															Wild
Wolfe	1	22,003	27	44219	44246	2093	0	2	40	2095	40	2135	70	15	419.5	434.5	15.0	1592.99	Labor used as scouts	716.59	146.35	.055	Private	
Powell	1	2,265	0	4725	4725	0	0	0	0	0	0	0	0	0	21.0	21.0	3.0	76.84		156.35	0.0	.049	Private & state park	
Menifee	1	1,314	0	8630	8630	0	0	0	56	0	56	56	?	0	122.0	122.0	11.0	439.91		673.07	41.22	.134	Private	
Morgan	1	409	0	1944	1944	0	0	0	74	0	74	74	?	0	25.5	25.5	2.0	91.30		227.14	0.0	.163	"	
Lee	1	351	0	1798	1798	0	0	0	1660	0	1660	1660	?	0	18.0	18.0	10.0	69.25		106.96	61.40	.132	"	
Magoffin	1	30	0	180	180	0	0	0	0	0	0	0	0	0	2.0	2.0	0	7.65		23.22	0.0	.171	"	
Rowan**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	6.08		0.0	0.0	x	"	
Bath	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	1.0	1.0	3.26		0.0	0.0	x	"	
Estill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	1.0	0.5	1.34		0.0	0.0	x	"	
Breathitt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	1.0	0.0	3.37		12.18	0.0	x	"	
Total	6	26,372	27	61496	61523	2093	0	2	1830	2095	1830	3925		15	613.	628.	45.5	2291.99		1915.51	1129.63***	248.97	.090	

*No second eradication program

**Rowan, Bath, Estill & Breathitt are counties in which reconnaissance work was done, and no white pine located.

***Includes costs of office maintenance.

Supplement to Annual Report
Preeradication Survey
Oct. 16 - Dec. 31, 1934.

Since the closing of the regular control season on October 15, the work has consisted of making out statistical reports, writing of the annual report, and in making a reconnaissance of various counties for the purpose of locating additional stands of white pine.

In making a reconnaissance of the various counties, all passable roads were driven over in an attempt to locate pine and contacts were made with the county agents, C.C.C. camp superintendents, local lumbermen, farmers, and anyone who might be able to give information concerning the presence of white pine.

At the termination of appointments for the district agents on October 15, Powell and Menifee counties had not been completed, and were later finished by the State Leader. Of the additional counties covered, none proved to contain any pine, except McCreary which has only about 75,000 feet which is very scattered.

The following table shows the counties surveyed, and the amount of pine found.

<u>COUNTY</u>	<u>ACRES OF PINE FOUND</u>	<u>ACREAGE WORKED</u>
Powell	380	730
Menifee	750 (scattered)	0
McCreary	Scattered	0
Carter	0	0
Fleming	0	0
Boyd	0	0
Letcher	0	0
Harlan	0	0
Bell	0	0
Whitley	0	0
Wayne	0	0
Rockcastle	0	0
Laurel	0	0
<u>TOTAL</u>	<u>380</u>	<u>730</u>

Summary of Costs Covering Entire
Season - June 18 - Dec. 31, 1934.

Control Season - June 18 - October 15, 1934.

Scouting and Control Work

Labor Costs	\$2291.99
Supplies & Equipment	248.97
Total for Labor	<u>\$2540.96</u>
<u>Supervision by District Agents</u>	
Salary & Expenses	\$1915.51
Total for Labor and District Agents	<u>\$4456.47</u>
<u>Supervision by State Leader</u>	
Salary and Expenses	\$1045.17
Office Maintenance	84.46
Total for State Leader	<u>\$1129.63</u>

GRAND TOTAL	\$5586.10

Preeradication Survey

Reconnaissance & Office Work Oct. 16 - Dec. 31,

State Leader's Salary and Expenses	\$ 507.20
Office Maintenance	70.17
Labor	7.50
	<u>\$ 584.87</u>

State Government - June 18 - December 31, 1934.

Supervision by

State Forester	\$ 175.00
State Entomologist	55.00
<u>Office Space</u>	
For State Leader at Winchester, Ky.	30.00
For District Agent at Frenchburg, Ky.	30.00
Total for State	<u>\$ 290.00</u>

GRAND TOTAL FOR FEDERAL EXPENDITURES	\$6170.97
GRAND TOTAL FOR STATE EXPENDITURES	290.00

A copy of the Annual Report and the Supplementary Report, together with maps and a complete set of Pine Area Record Sheets, has been forwarded to the following places:

Office of State Forester, Frankfort, Kentucky.
Office of State Entomologist, Lexington, Kentucky.
Office of Forest Supervisor, United States
Forest Service, Cumberland Purchase Unit,
Winchester, Kentucky.

The work on the control of White Pine Blister Rust in Kentucky is

closing on December 31, 1934, and will not be resumed for a probable period of five years. All correspondence and reports have been forwarded to the Washington office, as well as all payments for outstanding items.

L. W. Brown,
State Leader.

APPENDIX TABLE 2.

ANALYSIS OF COSTS OF SCOUTING AND CONTROL WORK

JUNE 18 to OCTOBER 15, 1934.

Total Acreage Worked		Labor Costs *		Cost of Labor Plus District Agents				Total Costs **	
		Total for State	Per Acre Worked	Per Acre Protected	Total for State	Per Acre Worked	Per Acre Protected	Total for State	Per Acre Worked Pine Protected
61,523	26,372	\$2291.99	\$.037	\$.086	\$4207.50	\$.068	\$.159	\$5586.10	\$.21

* Includes only labor costs (wages).

** Includes all costs by Federal Government for labor, transportation, equipment, salary and expenses of all agents including State Leader and office maintenance.

APPENDIX - TABLE 3

COST SUMMARY

JUNE 18 to OCTOBER 15,

1 9 3 4

Federal Government
Scouting and Control Work

Labor Costs	\$2291.99
Supplies & Equipment	248.97
Total for Labor	<u>\$2540.96</u>
Supervision by District Agents	
Salary & Expenses	1915.51
Total for Labor & District Agents	<u>\$4456.47</u>
Supervision by State Leader	
Salary & Expenses	\$1045.17
Office Maintenance	84.46
Total for State Leader	<u>\$1129.63</u>
GRAND TOTAL OF ALL COSTS -----	<u>\$5586.10</u>

State Government - June 18th to October 15, 1934.

Supervision by	
State Forester	\$112.50
State Entomologist	42.50
Office Space	
For State Leader at Winchester, Kentucky.	\$ 30.00
For District Agent at Frenchburg, Kentucky.	30.00
TOTAL FOR STATE	<u>\$215.00</u>

SUMMARY OF EXPENDITURES FOR BLISTER RUST CONTROL

State KENTUCKY

APPENDIX TABLE IX

Calendar year 1934

Table I.- Expenditures for General Supervision and District BRC Agent Activities

	Salaries			Expenses			Total		
	B.F.I.	N.R.A.	State	Total	P.F.I.	N.P.A.	State	Total	Sal. & Exp.
General supervision		1014.92		1014.92		537.45		537.45	1552.37
BEC Agent Act.		972.04		972.04		943.47		943.47	1915.51
Total									

Table II.- Expenditures by Programs for Control Projects Other Than General Supervision and BRC Agent Activities

UNIT A	Projects	Regular Control Work		Ribes Eradication			Supervision of Ribes Eradication	Ribes Compensation	Treatment Diseased Fines	Field Data	Totals
		State	Expenses	Nursery Sanitation	Special Control Work	Blk. Currant Eradication					
UNIT B	Wages	State									
		R.F.I.									
		Total									
	Expenses	State									
UNIT C		R.F.I.									
		Total									
	Wages	State									
		R.C.W.									
UNIT D		Total									
	Expenses	State									
		R.C.W.									
		Total									
UNIT E	Wages	State	155.00							135.00	290.00
		N.R.A.	2291.99							7.50	2299.49
		Total	2446.99							142.50	2589.49
	Expenses	State	0.00							0.00	0.00
UNIT F		N.R.A.	248.97							0.00	248.97
		Total	248.97							0.00	248.97
	Total		2695.96							285.00	2980.96
UNIT G	Wages	State									
		F.E.R.A.									
		Total									
	Expenses	State									
UNIT H		F.E.R.A.									
		Total									
	Expenses	State									
		F.E.R.A.									
UNIT I		Total									
	Total										

M A R Y L A N D

Annual Report of
BLISTER RUST CONTROL IN MARYLAND

1934

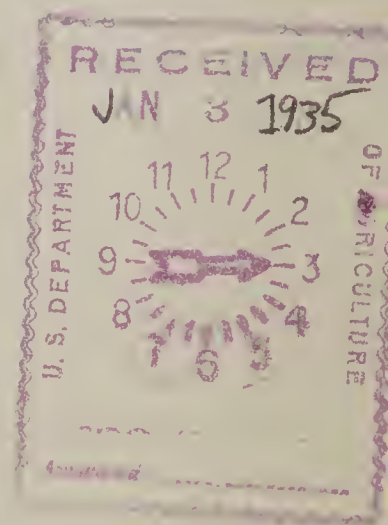
By

H. E. Yost
Agent

FOREWORD

This report is submitted in two parts, the first covering that period of January 1 to October 15, and the other the remainder of the year. The work is divided into two general types: Eradication and other work, the first covering generally that period of May 1 to October 15, and the second the remainder of the year. The "other work" consists principally of scouting, mapping, interviewing landowners, educational activity, preparation of reports, and analysis of data.

All cost figures in this report may be slightly in error due to suspensions, discounts, etc., made in the Washington accounting office, which could not be checked for several months. The figures, however, should be within one or two per cent correct.



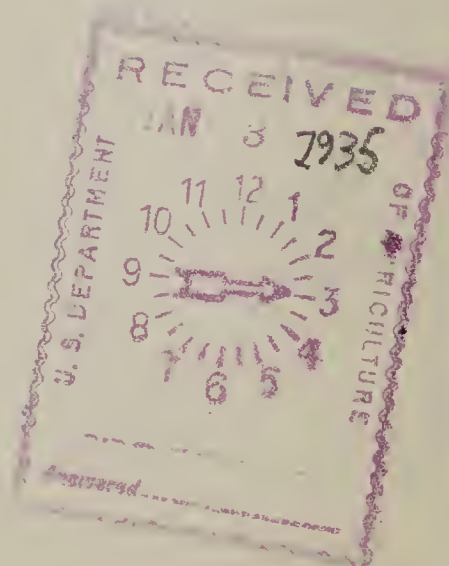
ERRATUM

Page 6, Line 4. Maryland State Department of Forestry has not filed application for permit for interstate shipment of white pine because no such shipments are made.

Page 6, Paragraph 5. White pine trees shipped from the State Nursery were used principally on State Forest land.

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ANNUAL REPORT OF BLISTER RUST CONTROL WORK IN MARYLAND
January 1 to October 15, 1934.

The beginning of blister rust control work in Maryland was made possible by an allotment from the Public Works Administration to the Division of Blister Rust Control, Bureau of Plant Industry, in September, 1933. Since that time this Division has become a part of the Division of Plant Disease Control in the Bureau of Entomology and Plant Quarantine. The work however was not impaired by this change. Eradication work was begun in September, 1933 and continued until the end of October, 1933. During this time approximately 188,000 Ribes were destroyed on nearly 2,000 acres of land and about 190 acres of white pine were protected. This large acreage was due to the fact that much of the pine was in small areas. The remainder of 1933 was spent on locating, mapping and scouting white pine. The responsibility for the work rested with the State Forestry Department. The United States Department of Agriculture provided the funds and served as technical advisor in cooperation with the State Plant Pathologist. The State of Maryland agreed to expend in services up to \$1,000.00 during the fiscal year ending June 30, 1934. This agreement was extended up to June 30, 1935.

AMENDMENT TO
MEMORANDUM OF UNDERSTANDING
Effective July 1, 1932
Between

THE UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY, THE
MARYLAND STATE HORTICULTURAL DEPARTMENT AND THE MARYLAND STATE
DEPARTMENT OF FORESTRY

Cooperative Work in Controlling White Pine Blister Rust in Maryland.

- - - - -

The undersigned mutually agree that the memorandum of understanding between the United States Department of Agriculture, Bureau of Plant Industry, the Maryland State Horticultural Department and the Maryland State Department of Forestry effective July 1, 1932, to continue in effect until June 30, 1933, shall be continued in full force and effect in all its provisions for the fiscal year ending June 30, 1934 with the exception of D-2 and D-6 which shall be amended to read as follows:

D-2. That this memorandum of understanding shall take effect July 1, 1933 and continue in effect until June 30, 1934, provided that either party may terminate the agreement at any time by a written statement to that effect 30 days in advance of the date of termination desired.

D-6. That for the fiscal year July 1, 1933 to June 30, 1934 the Maryland State Horticultural Department and its cooperators will expend about \$1,000, and the Federal Government in behalf of the United States Bureau of Plant Industry about \$8,000 in connection with the work herein provided for, provided, however, that the maximum expended by the Federal Government shall not exceed \$10,000.

<u>4/20/34</u> Date	<u>F.W. Besley,</u> State Forester, Maryland State Department of Forestry
<u>4/10/34</u> Date	<u>O.B. Symons</u> Maryland State Horticultural Department.
<u>5/3/34</u> Date	<u>K. F. KELLERMAN</u> Acting Chief, Bureau of Plant Industry, U.S. Dept. of Agri.

AMENDMENT TO
MEMORANDUM OF UNDERSTANDING
Effective July 1, 1932
Between

THE UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF ENTOMOLOGY, THE
MARYLAND STATE HORTICULTURAL DEPARTMENT AND THE MARYLAND STATE
DEPARTMENT OF FORESTRY

Cooperative Work in Controlling White Pine Blister Rust in Maryland.

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Whereas,

The said cooperative work in controlling white pine blister rust in Maryland has, by reorganization within the Department of Agriculture, been transferred to the Bureau of Entomology of said Department.

Now, therefore, in accordance with the foregoing provision and pursuant to such reorganization, it is mutually agreed that the paragraphs D-2 and D-6 of the Memorandum of Understanding described above shall be amended as follows:

D-2. That the several undertakings of this memorandum shall continue in effect until June 30, 1935, provided that any one of the parties may terminate the agreement by a written statement to that effect 30 days in advance of the termination date desired

D-6. That for the fiscal year July 1, 1934 to June 30, 1935, the Maryland State Horticultural Department and its cooperators will expend about \$1,000 and the Federal Government in behalf of the United States Bureau of Entomology about \$11,500 in connection with the work herein provided for, provided, however, that the maximum expended by the Federal Government shall not exceed \$12,500.

4/20/34

F.W. Besley

State Forester, Maryland State Department of Forestry.

4/19/34

B. Symons

Maryland State Horticultural Department.

5/1/34

LEE A. STRONG

Chief, Bureau of Entomology, U.S. Dept. of Agriculture.

PERSONNEL

The following table shows the names, position, address, and rating of the blister rust control men in Maryland:

(1 - Good; 2 - Fair; 3 - Poor; 4 - Unsatisfactory)

H.C. Buckingham	Deputy Cooperator	Cumberland, Md.	
H.E. Yost	State Leader	Grantsville, Md.	Sept. 19, 1934.
H. Carey McMahon(2)	Agent	Frostburg, Md.	June 1, 1934
			Aug. 15, 1934.
Daniel W. Norris (1)	"	Hancock, Md.	May 1, 1934
			Oct. 15, 1934
E.R. Porter (1)	"	Oakland, Md.	May 16, 1934
			Oct. 16, 1934
Hobart Bucey (1)	Straw-boss	Frostburg, Md.	
Wm. Murphy (2)	" "	" "	May 21, 1934
			Oct. 4, 1934
Grayson D. Wilson (2)	" "	Flintstone, Md.	

LABORERS

Chester Amick (2)	Oldtown, Md.	Harry Stahl(1)	Grantsville, Md.
Leroy Beck (4)	Cumberland, Md.	Wright Thayer (1)	Oakland, Md.
Allen Carey (3)	Frostburg, Md.	F.V. Thomas (1)	Oldtown, Md.
Walter Combs(1)	Mt. Lake Park, Md.	James Twigg (2)	Mt. Lake Park, Md.
John M. Davis(3)	Oldtown, Md.	Jesse Vanneter(3)	" " " "
Boyd Deffinbaugh(2)	" "	Wilford Warne(2)	Grantsville, Md.
Elmer Deffinbaugh(2)	" "	Bruce Warnick (2)	" "
Dayton Dolley (1)	Flintstone, Md.	George Zapf (4)	Cumberland, Md.
Harry Durst (1)	Jennings, Md.	J.J. Zapf (3)	Oldtown, Md.
Otis Fike (1)	Oldtown, Md.		
John P. Fletcher (2)	Little Orleans, Md.		
John Garland (2)	" " "		
Adam Hanft (2)	Grantsville, Md.		
Robert Helbig(2)	Oakland, Md.		
L.B. Heller (2)	Hancock "		
Raymond Hettenhouser (2)	Little Orleans, Md.		
Russell Hose (2)	Oldtown, Md.		
Dayton M. Lewis (3)	" "		
Thomas McAtee (2)	" "		
E.C. McCusker (2)	Little Orleans, Md.		
Taylor McLoughlin (2)	Oldtown, Md.		
Chas. Miller (4)	Oakland, Md.		
Jacob Miller (2)	" "		
Harry Murphy (2)	Mt. Lake Park, Md.		
Raymond Paugh (1)	" " " "		
Ralph Robinette (2)	Flintstone, Md.		
Lafayette Smith (4)	" "		
Floyd Spiker (2)	" "		

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WHITE PINE IN MARYLAND

Table showing the acreage in the State by counties.
(5% or more of the stand being white pine.)

<u>Counties</u>	<u>No. acres protected</u>	<u>To protect</u>	<u>Not justifiable to protect x</u>	<u>Total</u>	<u>Estimated acreage in counties not mapped</u>
Garrett	1520xx	70	1069 xxx	2759	
Alleghany	26000	0	500	26,500	100
Washington	4000	6000**		5,000	1,000
Frederick	50	400*		350	300
Baltimore	0	500*		500	500
Montgomery	0	30*		30	30
Others	0	-			

*J.A. Cope estimate

** H.E. Yost "

* - Usually isolated areas where wild Ribes are very abundant and where the expense of eradication does not seem to be justified.

xx - Includes 190 acres protected in 1933.

xxx - Probably 2000 acres in addition not justifying mapping.

2. Lumber Production for the last five years.

The following table shows the white pine lumber production for the last five years for Maryland. The figures were supplied by the Maryland State Department of Forestry.

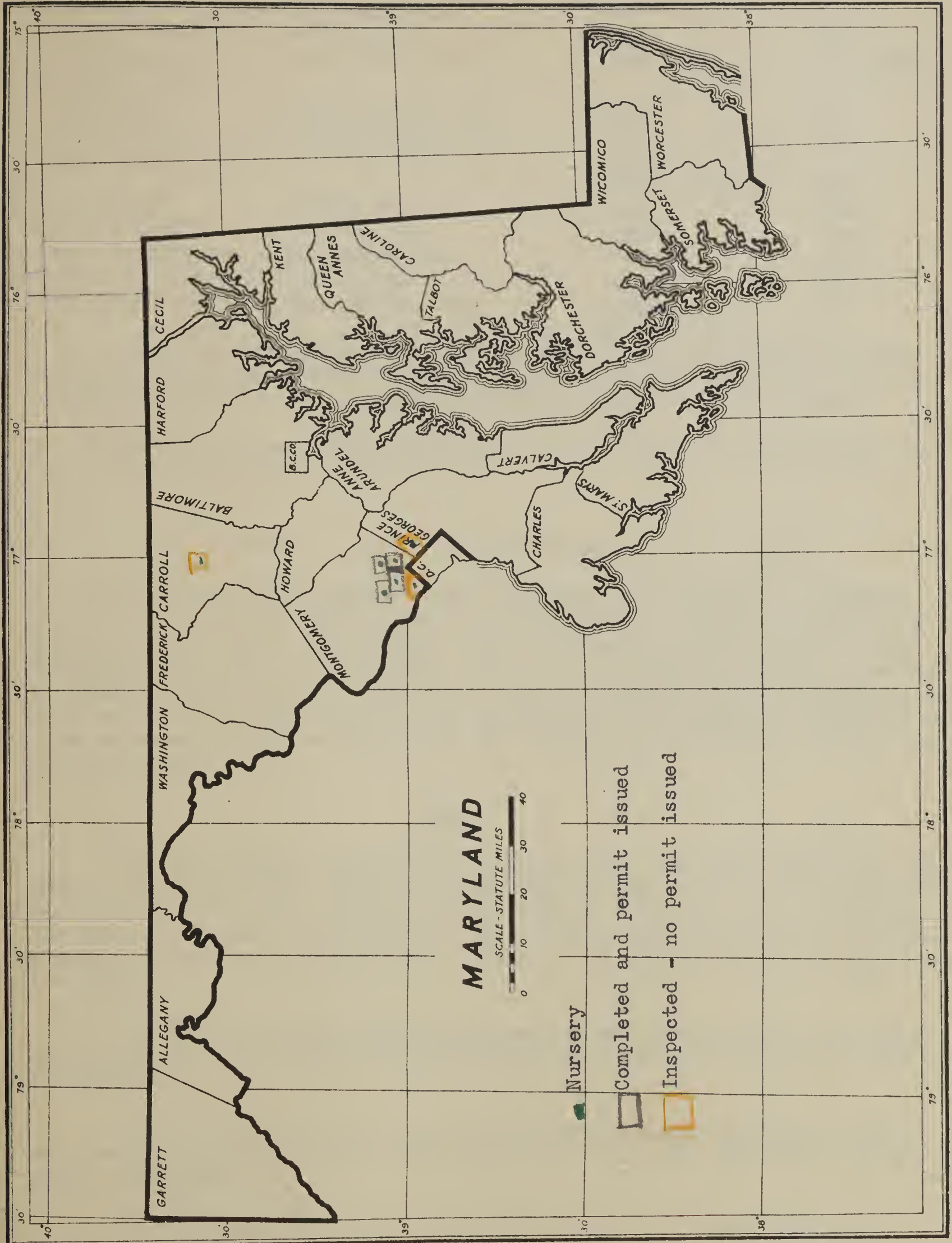
<u>Year</u>	<u>Board ft. of white pine</u>	<u>Estimated average stumpage value \$6</u>	<u>F.O.B. mill (\$20.00)</u>
1929	900,000	\$5400	\$18,000
1930	500,000	3000	10,000
1931	500,000	3000	10,000
1932	500,000	3000	10,000
1933	750,000	4500	15,000
<u>Total</u>	<u>3,150,000</u>	<u>\$18,900</u>	<u>63,000</u>
<u>Average</u>	<u>630,000</u>	<u>3,780</u>	<u>12,600</u>

During the period 1930-1932, inclusive, less than the usual amount of lumber as well as other products were marketed. No figures are available for 1934, but it is probable that they will be as much or more than in 1933. The lumbering was done almost entirely by small mills operated usually during only a part of the year.

4. Nurseries Growing white pine



3 Map showing distribution of white pine.



3 Map showing nurseries growing white pine and their status of control.

<u>Name</u>	<u>Address</u>	<u>No. white pine</u>	<u>Interstate shipping permit used?</u>
Gude & Sons	Rockville, Md.	5,000	Yes ✓
Harrison Nursery	Berlin, Md.	1,000	Yes
Leys Nursery	Camp Springs, Md.	150	No (growing Ribes)
Md. State Dept. of forestry	College Park, Md.	100,000	No
Quaint Acres	Silver Springs, Md.	200	Yes ✓
Rock Creek Nursery	Rockville, Md.	425-P strobilus 108-P. excelsa	No
Rolandhurst	Hebron, Md.	400	Yes
Small & Sons	Norbeck, Md.	3,000	Yes
Titus Nursery Co.	Baltimore, Md.	Unknown	Yes
Towson Nursery	Towson, Md.	4,901	Yes ✓
Westminster Nursery	Westminster, Md.	Unknown	No
Total		115,184 plus	

This list includes only those nurseries that have applied for permission to make interstate shipments of white pine and some that have been otherwise contacted. It does not include all nurseries in the State.

5. White pine nursery stock distributed from the State nursery during the past two years is as follows:

1932 - 53,450; 1933 - 28,290; Spring of 1934 - 47,789.

6. Stand in saw timber and cordwood with value is estimated as follows:
71,66,000 board feet of white pine saw timber with a stumpage value of \$5.00 per thousand or \$358,330.00 and 258,656 cords at \$9.00 per cord or \$2,327,894.00. The total stumpage value of the white pine forest is estimated at \$2,686,224.00. These figures are only for Garrett, Allegany Counties and that part of Washington County west of Sideling Hill Mountain. Considerable pine is known to be present east of this point, but to date no detailed survey has been made.

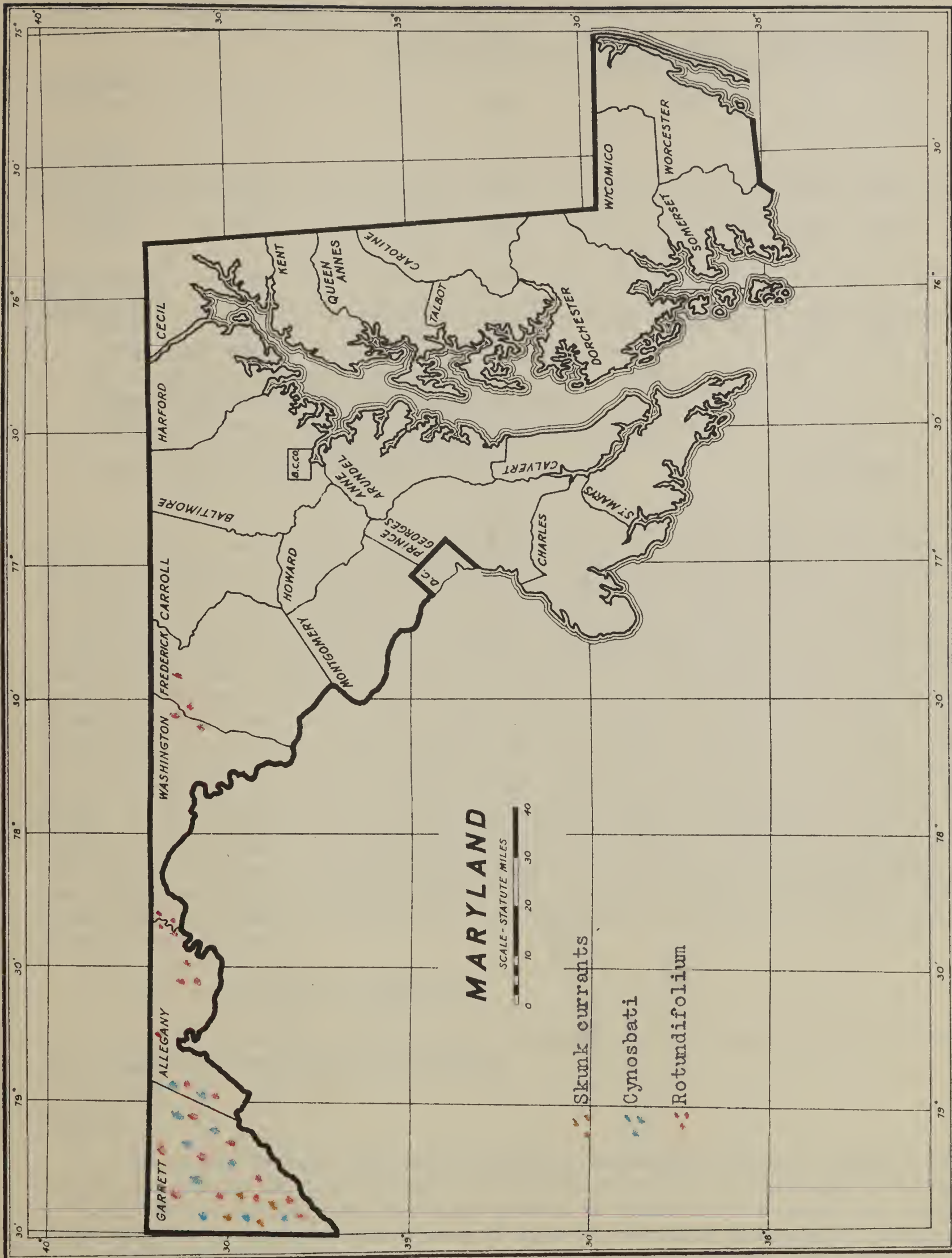
RIBES

1. No intensive study of cultivated Ribes was made except where they were located near white pine. From the observation thus far it is believed that in Garrett County cultivated Ribes will be found at about four fifths of the houses and about the following ratio: Red or white currants - 7; Gooseberries - 2. Flowering currants 1. This is a probable average for the entire country.

To date no owners have been found who were growing them for commercial purposes. The bushes are usually well cared for and in a good state of cultivation.

The following table gives the findings in Eastern Allegany County and that part of Washington County west of Sideling Hill Mountain, and the number destroyed.

Situation Relative to Cultivated Ribes in Western Washington County and Eastern Allegany County Proposed Control Area.



3 Map showing the distribution of wild species of ribes.

County	No. of owners having no cult. bushes	No. of places with bushes where all were destroyed		No. of places where part of bushes have been destroyed			No. of places where no bushes have been pulled		Out of infect- ing Range	
		Owners	Bushes	Owners	bushes	In	Owners	bushes	O.	B.
Allegany						Out				
Paw Paw Quad.	101	62	465	4	24	84	37	437		
Allegany										
Flintstone Quad.	76	36	222	3	4	7	23	146	7	47
Allegany										
Total	177	98	687	7	28	91	60	583	7	47
Washington	9	10	51				4	15		
Fulton Pa.	1								1	3
Total	187	108	738	7	28	91	64	598	8	50
Total land owners		374								
Total cultivated Ribes eradicated					766					
Total cultivated Ribes to be eradicated					689					
Total cultivated Ribes not necessary to eradicate being out of infecting range.								50		
Total owners refusing complete eradication								71 or 18%		

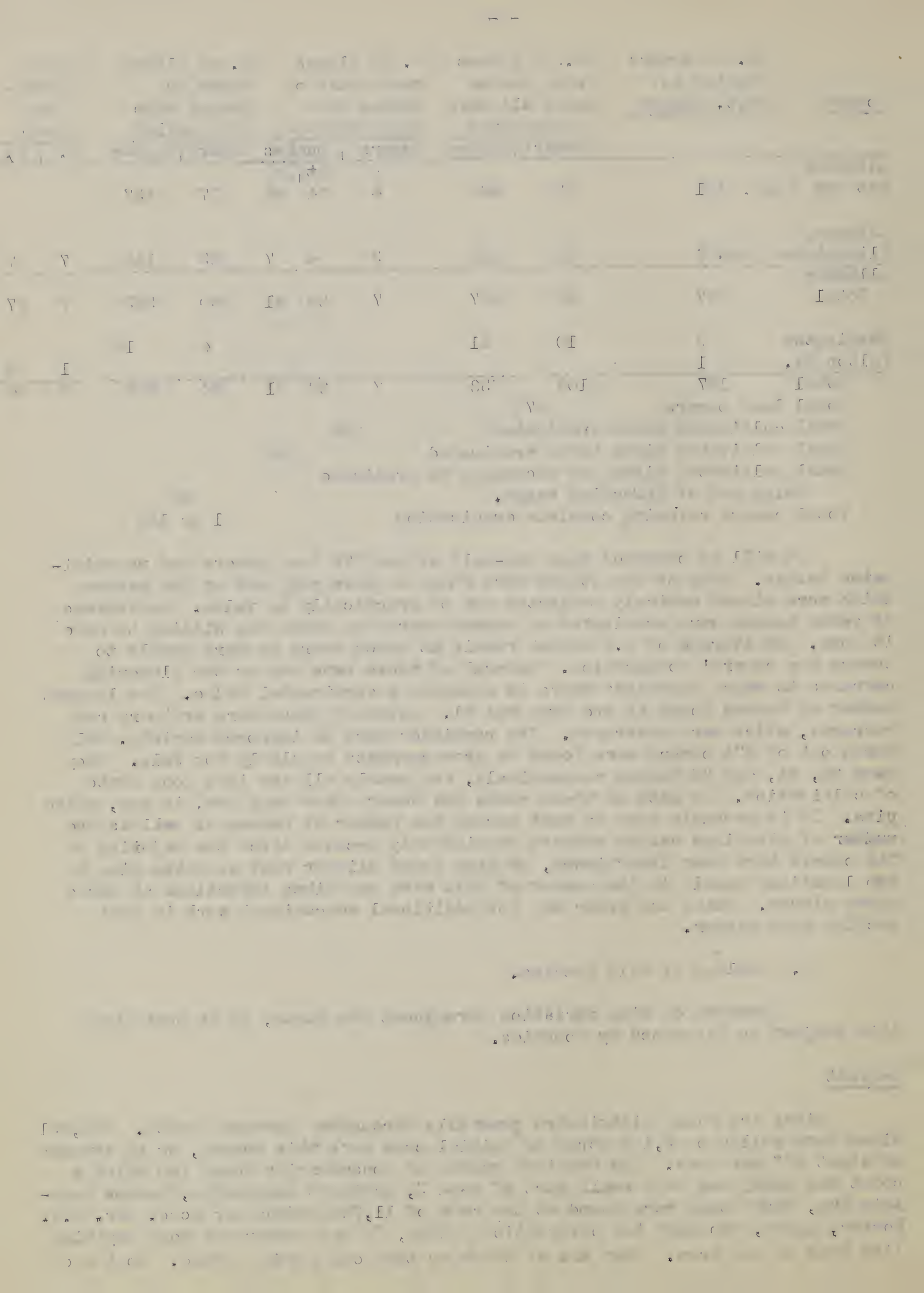
It will be observed that one-half of the 374 land owners had no cultivated bushes. Many of the others were found to have only one or two bushes which were almost entirely neglected and of practically no value. An average of seven bushes were eradicated at houses where the owner was willing to have it done. An average of 9.5 bushes remain at homes where we were unable to secure the owners' cooperation. Several of these have one or two flowering currants to which sometimes there is attached a sentimental value. The largest number of bushes found at one home was 91. Seven of these were ordinary red currants, which were destroyed. The remainder were an improved variety. Only three out of 374 owners were found to grow currants regularly for sale. They have 24, 84, and 75 bushes respectively, and nearly all are in a good state of cultivation. In each of these cases the owners have very few, if any, white pine. It is probable that by next spring the number of bushes as well as the number of plantings can be reduced considerably because since the majority of the owners have been interviewed, we have found blister rust on white pine in two locations nearly in the center of this area and Ribes infections at three other places. Plans are under way for additional educational work in this section this winter.

2. Ecology of wild species.

Because of wide variation throughout the State, it is best that this subject be discussed by counties.

Garrett

Ribes are found distributed generally throughout Garrett County. 869,431 Ribes were pulled on 3,180 acres of initial crew work this season, or an average of about 273 per acre. The heaviest growth of gooseberries found (on which a count was made) was on a small part of Area 3, Accident Quadrangle, Meadow Mountain Run, where they were found at the rate of 11,728 bushes per acre. Mr. E.R. Porter, Agent, who made the observation stated, "I have never yet seen anything like this on one area. They are as thick as they can possibly stand. Most are



medium-sized." This particular place was on a northwest slope with medium amount of soil and duff, as is usual in Garrett County. Except under pure or nearly pure stands of white pine or hemlock the degree of shade or the character of the timber stand seems to have little if any bearing upon Ribes growth. Marsh ground is almost entirely found to be Ribes free. With these two exceptions, no general rules can be formulated as to where Ribes may or may not be found. About the only ground in Garrett County that can be safely assumed to be Ribes free are cultivated fields and marshy glades. The heaviest Ribes growth, however, is found on mountain ranges or similar land in narrow valleys. The lowlands in the vicinity of Ryans Glade near Swanton are more nearly free from Ribes than the remainder of the county and as a whole similar conditions exists in the vicinity of Avilton between Red Ridge and Little Savage Mountain.

Last year no skunk currants were found except in the drainage area of the Youghiogheny River. Comparatively few Ribes cynosbati are found except on Meadow Mountain, where they constitute from one-third to one-half of all bushes, the others being almost without exception Ribes rotundifolium. Occasionally there is found what we believe to be Ribes hirtella, although to date no one would positively identify it as such. An attempt will be made to secure specimens of this when they are in bloom, at which time positive identification can be made.

It has been found that where a heavy growth of bushes was eradicated and the soil disturbed to an appreciable extent that a heavy growth of seedlings will follow. The experience in the north has been that nearly all of the seeds thus caused to germinate do so within three years; therefore, if the source of the seed has been destroyed, very little trouble should result from seedlings after three years.

Allegany

No detailed study of Ribes ecology was made in this county except where considerable white pine was found; that is, from Sideling Hill Creek west to Warrior and Martin's Mountains. Wild Ribes are known to be present on the southern half of Warrior Mountain, on Martin's Mountain, Collier's Mountain, and in George's Creek Valley. They are probably present on Dan's and Will's Mountains.

In the proposed control area which was worked, all the wild Ribes locations were carefully marked on the U.S.G.S. maps. With few exceptions they were found only on and near cliffs and bluffs and almost entirely on shale rocks and soil. Practically none, except as noted, were found on limestone and sandstone soils. They were usually near streams, except on Town Hill at elevations of 1,800 feet or more. The elevations of the stream beds vary from five hundred to eight hundred feet. Very few, if any, wild Ribes were found above 1,000 feet, except as noted on Town Hill. This leaves an intermediate belt, between 1,000 and 1,800 feet, which, insofar as we know, is Ribes free. It is probable that moisture and soil conditions are the predominating factor, rather than elevation. It is also interesting to note that between the Maryland - Pennsylvania line and U.S. Route #40 only five wild Ribes were found. They were on the crest of Town Hill about 300 yards north of the Town Hill Hotel. The bushes found at high elevations were always growing in very rocky ground, usually sandstone.

The bushes found at the lower elevations were usually growing where shade was light or entirely absent; however, in small gullies and draws, vigorous bushes were found growing in heavy brush and medium to dense shade.

In a few instances Ribes were found growing in decayed stumps, and one was found in the crotch of a large tree. Bushes growing in decayed logs, slab, and sawdust piles were rarely found. So frequently were bushes found on bluffs and cliffs that it was found necessary to equip each group of men with a rope. Usually fifty feet of half-inch rope was found sufficient; however, in a few cases one hundred and twenty-five feet of three-quarter-inch rope was used.

It is probable that the eradication work over a period of time will be greatly aided by the soil or climatic conditions which apparently are unfavorable for Ribes growth. Only a medium amount of seedlings were found and very few bushes between six inches and eighteen inches. It, therefore, seems that there is a heavy mortality in bushes from their second to fifth years. One specific instance was noted in checking one area of about ten square feet on the point of a rock ledge found, on which apparently many seeds had been deposited by some source. A total of 65 bushes were found. Of these 14 were living and 51 dead. None of the bushes was over one foot high. They were growing with ferns and in a duff composed of hemlock twigs and needles and under light to medium shade. Other similar instances were observed but no detailed notes made.

Complete elimination of Ribes is possible on much of this area, and practical elimination is within reason over all of it.

The only species found which could be positively identified was rotundifolium. Probably one-fourth of the bushes apparently were hybrids, having up to three nodal spines and leaves varying from a decidedly wedge shape to a typical cynosbati rounded base; also from smooth, new canes to heavily spined ones, as in cynosbati. It is probable that many of these were escaped cultivated bushes. The opinion was borner out by Dr. C.E. Temple of the University of Maryland.

Ribes americanum was found in two locations; namely, in Scavel Hollow near the home of Elmer Deffinbaugh on Town Creek, and near the home of Hugh James on Flintstone Creek. In each instance it was difficult to ascertain whether or not they were growing wild or were abandoned bushes. It is probable that they were abandoned as only two locations were found.

Escaped red currants were found in only one place, which was on the crest of Stratford Ridge near the home of L.A. Carter. Three bushes were found growing in a large pile of stones. The average number of bushes found was slightly less one bush for two acres when the entire area is considered. On the ground where Ribes were found the average was probably 10 bushes per acre.

Washington

The part of Washington County west of the crest of Sideling Hill is identical with conditions in Allegany County. A preliminary survey was made of the remainder of the county. Wild Ribes are known to be

On the 10th of January, 1881, the first of the
winter storms of the season set in, and was
accompanied by a heavy fall of snow.

The weather was very cold, and the wind
blew from the north-east, bringing with it
a heavy fall of snow, which lay deep on the
ground. The temperature was very low, and
the wind continued to blow from the north-east
for several days, bringing with it a heavy
fall of snow, which lay deep on the ground.

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1881

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fall of snow, which lay deep on the ground.

present, making from medium to heavy growth, on South Mountain near Pen Mar, High Rock, and Raven Rock Hollow.

Wild Ribes have been found on the east side of South Mountain in Frederick County, also in the Catoclin Mountains at a higher elevation. As far as is known no wild Ribes are present in any of the counties east of Frederick, although they have been reported in botanical literature.

WHITE PINE BLISTER RUST

What it is:

"Blister rust (*crataegium ribicola*) is a plant disease which is caused by the growth of a parasitic fungus within the inner bark of the white pine tree and in the leaf tissues of Ribes (currant and gooseberry bushes)."

Description of the host plants:

White Pine: "The blister rust fungus attacks only those pines which have their leaves - 'needles' - in clusters of five. The eastern white pine - *Pinus strobus* - is the only five-needled pine native to the eastern United States. In the west, there are seven other native five-needled pines of which the two most important are *Pinus monticola* - western white pine, and *Pinus lambertiana* - sugar pine."

Ribes: "All species of Ribes are susceptible to the blister rust, although the European black currant is the most susceptible species and is frequently responsible for the long-distance spread and establishment of the disease."

BRIEF HISTORY

"The disease probably originated in Asia and spread over Europe. First reported in Europe in 1857. The introduction of the rust into the U. S. resulted largely from the importation of white pine planting stock principally from German and French nurseries, where the stock had been exposed to infection. It was first discovered in North America at Geneva, New York, in 1906, on Ribes, and in 1909 on white pine. There is ample evidence, however, to indicate that it was present in this country as early as 1897 at Kittery Point, Maine."

PRESENT DISTRIBUTION IN THE UNITED STATES

"The blister rust is now generally distributed throughout New England and northeastern New York. It is also present in Pennsylvania, New Jersey, Virginia, West Virginia, Maryland, Ohio, Michigan, Wisconsin, Minnesota, and Iowa. In the west it has been found in British Columbia and in the States of Washington, Oregon, Idaho, and Montana."

HOW THE DISEASE SPREADS

"Blister rust is transmitted by means of minute seed-like structures

called spores, which are blown about by the wind or carried by currents of air."

TYPES OF SPORES

"There are five distinct types of these spores, all but one of which function in the spread of the disease. The first type, aeciospores, are produced on diseased pines early in the spring, April 15 - June 15. These spores transmit the disease to currant and gooseberry leaves upon the under side of which a second type of spore is produced. Spores of the second type, urediniospores, are liberated about May, and seven generations of these may be produced during the season, thus intensifying the disease on Ribes.

"In mid-summer a third type, teliospores, appear on the diseased Ribes leaves. These spores germinate and produce a fourth type known as sporidia, and these transmit the disease to white pine trees.

"A fifth type, pycnospores, appear on the diseased pine bark from June until winter. These spores are contained in small drops of very clear, sweet-tasting liquid. As far as is known, however, this stage merely indicates the presence of the disease, and these spores in no way act to transmit it."

CHARACTERISTIC APPEARANCE OF THE DISEASE OF THE HOST PLANTS ON WHITE PINE

"Infection takes place through the breathing pores of the needles during the season of sporidia production. There follows then a period of incubation of from $1\frac{1}{2}$ to $3\frac{1}{2}$ years before the blisters burst through the bark of the diseased tree. During this incubation or dormant period, the symptoms of the disease are as follows:

66 First season. Small orange yellow spot usually produced from six to eight weeks after the sporidium falls on the needle. This stage is not readily identified in the field.

66 Second season. Filaments of the fungus grown down the needle into the bark of the branch and spread out to a distance of from $\frac{1}{4}$ to 2 inches. The bark becomes pale yellow or slightly orange.

66 Third season. Canker enlarges, pycnial drops may begin to form by June 7 and continue up to the winter. When these drops dry up there remain pycnial scars - which are very characteristic and make identification of the disease certain."

ON RIBES

"The first evidence of the disease on the leaves of Ribes is the development of small patches of a yellowish appearance on the under side of the leaves. As the intensity of the infection increases, these spotted areas increase until they may completely cover the surface of the leaf. In mid-summer, brown hair-like or horn-like projections develop from these patches. These are called telial columns and are often so abundant that they come to the surface of the leaf, giving to it a decidedly rusty appearance." (Mass. "Manual for Field Men.")

STATUS IN THE STATE

It is probable that blister rust is present in nearly every community having white pine and Ribes in Garrett, Allegany, Washington, and Frederick Counties. Comparatively few white pine infections have been found, but Ribes infections were found over practically this entire area. It must be born in mind that only close examination will reveal a Ribes infection and that to the casual observer, diseased pine may not be noticed for ten to fifteen years after the initial infection.

The following table shows the present known infections:

Location	County	Owner	Infection on White Pine Ribes	Date Found	Eradi- cated
1. 5 mi. W. of Oakland	Garrett	A. J. Kolbflesh	Rotundi- folium	1933	Yes
2. Shady Bower on Rt. #40	Washington	D. F. Hull	Aureum	1931	No
3. Shady Bower	Washington	F. Heineman	Nigrum	1931	No
4. Clear- spring	Washington	Mr. Seiberts	Aureum	1931	No
5. Big Spring	Washington	C. E. Newkirk	Aureum	1931	No
6. High Rock, $\frac{1}{2}$ mi. N. on Pen Mar - High Rock Road	Washington	Unknown	Strobus Rotundi- folium	1931	No
7. Cavetown 2 mi. S.E. RR Warner Gap Hollow Rd.	Washington	Unknown	Rotundi- folium	1931	No
8. Frost- burg RFD #1	Allegany	Anton Strunts	Nigrum (6) Sativum (2)	1931 1932	No
9. Frost- burg RFD #1	Allegany	Mrs. Richey	Rotundi- folium	1931	No
10. Frostburg RFD #1	Allegany	D. W. Athey	Nigrum (1)	1931	No

Location	County	Owner	Infection on White Pine Ribes		Date Found	Eradi- cated
11. Frostburg RFD #1	Alleghany	J. Strunts		Nigrum (2)	1932	No
12. Frostburg RFD #1	Alleghany	Chas. Sigler		Nigrum (1)	1931	No
13. Carlos Jct. $\frac{1}{2}$ mi. W. About $3\frac{1}{2}$ mi. S. Frostburg	Alleghany	Unknown		Cynos- bati	1931	No
14. One mi. E. of Bittering on Meadow Mt. Road	Garrett	L. C. Emory	P. Strobus	Rotundi- folium	1934	Yes
15. $1\frac{1}{2}$ mi. E. Bittering on Meadow Mt. Road	Garrett	A. Bowser	P. Strobus	Rotundi- folium	1934	Yes
16. Crest of Negro Mt. $\frac{1}{2}$ mi. N. of U.S. #40	Garrett	H. C. Bill	P. Strobus	Rotundi- folium	1934	No
17. $2\frac{1}{2}$ mi. N. Grantsville on Crab Run	Garrett	Albert Yoder	P. Strobus	Rotundi- folium	1934	No
18. $4\frac{1}{2}$ mi. W. Frostburg on U. S. # 40	Garrett	McMahon Bros.		Rotundi- folium	1934	Yes
19. 1 mi. N.W. Savage River on Elk Lick Run	Garrett	Unknown		Rotundi- folium	1934	No
20. E. side Meadow Mt. at Low Gap on N. Ger. Road	Garrett	Md. State Dep't. of Forestry		Rotundi- folium	1934	No
21. Head of Blackhawk Run, E. side Meadow Mt.	Garrett	Unknown		Rotundi- folium	1934	No
22. Meadow Mt. Run E. side Mt. 1 mi. N. of Deep Creek Lake, 2 places	Garrett	Arch Fr ^{ie} nd		Rotundi- folium	1934	Yes

Location	County	Owner	Infection on White Pine Ribes	Date Found	Eradi- cated
23. Toliver Run, Swallow Falls 2 places	Garrett	Md. State Dept. of Forestry	Rotundi- folium	1934	Yes
24. Deep Run, 1/8 mile S. of Dug Hill Rd.	Alleghany	Md. State Dept. of Forestry	P. Rotundi- Strobus folium	1934	Yes
25. 200 yd. N. of Long Pond Rd. & Gun Club & 200 yd. E. of Road	Alleghany	Long Pond Rod & Gun Club	P. Rotundi- Strobus folium	1934	Yes
26. 15 - Mile Creek S. end of Long Pond	Alleghany	Md. State Dept. of Forestry	Rotundi- folium	1934	Yes
27. S. point of Town Hill N. of 15 - Mile Creek, 2 mi. West	Alleghany	Long Pond Rod and Gun Club	Rotundi- folium	1934	Yes
28. S. Point of Town Hill N. of 15 - Mile Creek	Alleghany	Md. State Dept. of Forestry	Rotundi- folium	1934	Yes
29. W. side Sideling Hill Cr. 1/4 mi. S. Md. - Pa. Line	Alleghany	Mrs. M. F. Mann	Rotundi- folium	1934	Yes
30. 1 mi. W. of Aspen Hill Kennells on D. C. - Norbeck Road.	Montgomery	Mr. Hinebaugh	Nigrum	1934	Yes
31. 2 mi. W. of Hagerstown on U. S. #40	Washington	Unknown	Sativum	1934	No
32. 1/4 mi. E. of Owens on Catoclin Rd.	Frederick	George Willard	Rotundi- folium	1934	No

All of the infections on Ribes only were apparently "long distant hits"; that is, one mile or more except where the pines were also diseased. Numbers 19 - 23, inclusive, apparently come from pine infections Nos. 14 or 15, and No. 18 may have been from No. 17 or some unknown infection in Pennsylvania. No. 29 probably came from somewhere in Pennsylvania. Nos. 27 and 28 may have been from either Nos. 25 or 26. It is difficult to tell accurately where any given Ribes

infection originated if there are only two or three bushes infected.

Each pine infection will be discussed separately as there are only a few, and each should be studied and observed carefully.

NUMBER 6. HIGH ROCK - Near Pennsylvania - Maryland line, Washington County.

This infection was found by Mr. L. W. Hodgkiss and Mr. C. T. Gieser in 1931. Only one two-year old canker was found. No detailed study has been made since.

NUMBER 14. BITTINGER - Garrett County.

This was the first found and probably the oldest pine infection in the County, possibly in the State. It was found in January, 1934. One canker on three-year old wood was found, but could not be positively identified in the field. Further search during the winter revealed the rust on several trees. On May 5, the first uredinia was found on Ribes, and the telia were first found on July 5. Many three - and four - year old cankers were found, also several which appeared to be seven years old. While checking this area with Mr. D. H. Fitzwater, Regional Checker, during August, one canker apparently ten years old was found on a large tree. Several trees under ten years old have been found killed. On one tree about twelve feet high, thirty-seven cankers were counted and in September, one-third of the branches were brown.

NUMBER 15. BITTINGER - Garrett County.

This pine area is about one-half mile from No. 14. Heavy Ribes infections were observed, but very little on the pine. It probably became infected from No. 14. Ribes were heavy, and the area was small; therefore, as an experiment, a protection zone of only five hundred feet was cleared.

NUMBER 16. NEGRO MOUNTAIN - Garrett County.

Only one canker on two-year old wood was found. This being regarded as suspicious, it was sent to the Division of Forest Pathology and identified as blister rust. Since then no more cankers and no Ribes infection have been found. The area was not worked as the amount of pine was too small to justify it.

NUMBER 17. CRAB RUN - Garrett County.

This infection was first found in February, 1934. Three branches were found with an infection resembling blister rust which was identified as such by the Division of Forest Pathology. During the summer a heavy Ribes infection was found and several four-year old cankers. It is probable that the disease entered in 1927, or possibly 1930. The area was too small to justify protection, considering the large number of wild Ribes present. Very few dead branches and no dead trees were found.

NUMBER 24. DEEP RUN - Allegany County.

This infection was first reported by F. V. Thomas and Taylor McLaughlin while eradicating wild Ribes bushes in September, 1934. Further inspection revealed a fairly heavy Ribes infection spread over about two acres. The first

diseased pine was found by Dr. J.F. Martin on October 1. A few small trees were found killed and others having trunk cankers. The oldest canker found was of 1927 origin. All the cankers found were cut out principally by the scouts in that section for the purpose of securing specimens rather than as a canker eradication project.

NUMBER 25. LONG POND CLUB - Allegany County.

This infection was also first reported by Thomas and McLaughlin as on Ribes. On the area surrounding it white pine was growing, principally reproduction up to 500 trees per acre in hardwoods and scrub pine. One bunch of 150 wild Ribes growing on about 200 square feet were found to be very heavily infected. On several of the leaves the blister rust had covered the entire lower surface. No other Ribes were found within about one-half mile. One white pine tree, about six feet high and about 20 feet from the bushes, was found to have three three-year old cankers, all of which had fruited. No other blister rust was found on pine at this location. This infection should receive careful study during the next few years.

The pine and Ribes infections found this summer clearly demonstrate that no area, county or state, having white pine can safely be assumed to be free from blister rust. Now it is known that at least ten years ago it became established in the center of the County and is spreading generally over the entire County, despite the fact that to date very little easily found killing has occurred. Allegany County, east of Martin's Mountain, was generally believed to be free not only from blister rust, but also from wild Ribes. Now both are known to be present, and the former for at least seven years. It is probable that more disease is present than is known. Each employee was shown infected Ribes leaves and told to watch for it. It was not found until nearly the end of the eradication season. Infection No. 29 was found about October 1, on one bush and on ground which was worked during the last of May and the first of June. According to present plans "re-eradication" will be done in Allegany County as soon as the leaves appear; thus, greatly increasing the quality of the work, but reducing the chances of finding the disease to practically zero.

CONTROL WORK IN MARYLAND
PRIOR TO 1934

Prior to September, 1933, the principal blister rust work in Maryland consisted of nursery sanitation and scouting for the disease. This work was done by the State Horticulture and Forestry Departments in cooperation with the U. S. Department of Agriculture. One infection was found on pine at High Rock in Washington County, and several Ribes in Washington and Allegany Counties.

In September, 1933, funds became available for a more intensive program of work as a result of Federal Emergency appropriations. From September 15 to the last of October, sixteen laborers and two foremen worked 190 acres of white pine in Garrett County and destroyed 187,470 Ribes on 1886 acres. Most of the pine was in small areas which accounts for the large "total acres covered" as compared to the acreage in pine.

The remainder of the calendar year was spent in locating and mapping pine in preparation for the 1934 season for eradicating Ribes. This will be

discussed more fully in connection with pine location and pre-eradication survey in 1934.

Table showing results of preeradication survey of pine areas done by NIRA men outside of State & Federal Camps in 1934.

County	Acres Pine to Protect	Acres to be Worked	Estimated Man-days Labor
Garrett	1,330	5,000	1,000
Allegany	26,000	95,000	600
Washington	4,000	5,000	10
State	31,330	105,000	1,610

Local Control (Ribes Eradication.)

A table showing results of local control.

Work done in National Forests and National Parks and on Private and State lands by E. C. W. Camps.

Name of National Forest & Park or County if non-Federal land	Acres Pine Protected	Acres Worked	No. Ribes Pulled	Man - days Labor
Garrett - Oakland	See BRC 5 - A	80	57,652	163
Garrett - Grantsville	20	180	18,399	123
Allegany	See BRC 5 - A			6
TOTAL	20	260	76,051	292

B Work done by NRA and E.C.W. - see ~~next~~ page (24.)

C. Table Showing local Control Work Done by All Agencies.

Agency	Acres Pine Protected	Acres Worked	No. Ribes Pulled	Man-days Labor
N. R. A.	31,424	106,904	890,086	2,033.5
E. C. W.	20	260	76,051	292
TOTAL MARYLAND	31,444	107,164	966,137	2,325.5

75 - hr.
days.
6 - hr.

LABOR HOURS AND COST BY WEEKS

Week	Hrs. at .45¢	Am't.	Hrs. at .50¢	Am't.	Am't. Total	Hours Total
5/16-5/17	102	\$ 45.88		\$	\$ 45.88	102
5/18-5/24	456 $\frac{1}{2}$	205.42	60	30.00	235.42	516 $\frac{1}{2}$
5/28-5/31	390	175.50	24	12.00	187.50	414
6/4-6/7	546	245.70			245.70	546
6/11-6/14	525	236.25			236.25	525
6/18-6/22	543	244.35			244.35	543
6/25-6/28	586	263.70			263.70	586
Total to 6/30/34	3,148 $\frac{1}{2}$	\$1,416.80	84	\$42.00	\$1,458.80	3,232 $\frac{1}{2}$
7/2-7/7	652	293.40	30	15.00	308.40	682
7/9-7/12	644	289.80	30	15.00	304.80	674
7/16-7/19	652	293.40	30	15.00	308.40	682
7/23-7/28	652	293.40	30	15.00	308.40	682
7/29-8/2	734	330.30	30	15.00	345.30	764
8/6-8/11	742	333.90	30	15.00	348.90	772
8/13-8/17	780	351.00	30	15.00	366.00	810
8/20-8/23	766	344.70	60	30.00	374.70	826
8/27-8/31	747	336.15	60	30.00	366.15	807
9/3-9/6	750	337.50	90	45.00	382.50	840
9/10-9/14	862	387.90	90	45.00	432.90	952
9/17-9/20	982	441.90	90	45.00	486.90	1,072
9/24-9/28	1,004	451.80	90	45.00	496.80	1,094
10/1-10/4	976	439.20	90	45.00	484.20	1,066
10/8-10/11	246	110.70	42	21.00	131.70	288
10/15	8	3.60			3.60	8
Total 7/2-10/15	11,197	\$5,038.65	822	\$411.00	\$5,449.65	12,019
Total 5/16-6/28	3,148 $\frac{1}{2}$	1,416.80	84	42.00	1,458.80	3,232 $\frac{1}{2}$
Grand Total	\$14,345 $\frac{1}{2}$	\$6,455.45	906	\$453.00	\$6,908.45	15,251 $\frac{1}{2}$

EXPENDITURES BY MONTH

Supervisory Personnel

January 1 - October 15, 1934

Month	<u>PORTER</u>		<u>McMAHON</u>		<u>NORRIS</u>		<u>YOST</u>		Misc.
	Salary	Expense	Salary	Expense	Salary	Expense	Salary	Expense	
Jan.							150.00	65.51	
Feb.							150.00	45.71	.55
Mar.							135.00	80.48	.30
Apr.							135.00	93.84	.95
May	38.25				67.50		135.00	100.00	.95
June	76.50		76.50	13.00	67.50		135.00	138.90	3.35
TOTAL	114.75		76.50	13.00	135.00		840.00	524.44	6.10
July	80.74	36.10	80.74	45.00	71.24	12.30	142.50	113.55	9.45 17.95
Aug.	72.87	30.45	40.37	15.80	71.24	18.80	133.00	117.30	4.74 29.92
Sept.	80.74	21.95			71.24	31.00	142.50	143.55	2.00 33.77
Oct. -15	40.37	41.10			35.62	16.20	71.25	78.10	51.02 8.12
TOTAL	274.72	129.60	121.11	60.80	249.34	78.30	489.25	452.50	67.21 89.76

Jan. 1 - Oct. 15	TOTAL	389.47	129.60	197.61	73.80	384.34	78.30	1,329.25	976.94	73.31 89.76
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6. Checking Eradication Work.

Since the thoroughness of the crew is expressed by the findings of the checker, it must be remembered that these findings also express the thoroughness of the checker in an inverse ratio. Poor work checked by a careless checker may appear on paper as excellent work, while the same checker on ground covered by an extraordinary crew will be reported as almost perfect; therefore, when different crews are checked for comparison, it should be done by the same checker.

Detailed checking in Maryland was done mostly by the State Leader and the Regional Checker. In addition to this, general checking by the crew was done nearly every day. During the last half of the season, more checking was done by the foremen and crews. In one instance where poor work was found, a one-sixteenth acre plot was marked out, and the crew that did the work was called in to do the checking and assist in measuring the live stem. This had a very marked effect on the men and the quality of the work for the remainder of the season. General and strip checking over an area was found to save time and serve the purpose fairly well when only quantitative results are desired. When more detailed information is wanted, the plot method was found to be superior to any other.

The following table shows the results of the quantitative checks. These checks were made only on the ground where the heaviest growth of Ribes were found, therefore, the average feet of live stem and the average bushes per acre are about three times as great as it would be if all the ground were taken into consideration.

From the results of the checking the following conclusions may be made:

1. The number of feet of live stem left per acre in Garrett County indicated one or more of the following:
 - a. It is impractical in most areas to reduce the number of feet of live stem per acre to twenty-five in one eradication.
 - b. The check figures do not give an average number of Ribes for the entire area because the plots were placed on only the heaviest Ribes ground.
2. Careful checking should be done before the crew leaves an area.
3. More time must be spent in having the crew check their own work.
4. The foreman should spend more time in checking, and when possible, on ground worked by another foreman.
5. Some method should be used by the administrative checkers that will show more nearly an average of the entire area rather than the heaviest Ribes ground.
6. The most efficient work is done in that period of about two weeks in the spring when the Ribes are in leaf and other shrubs and trees are not yet in leaf.
7. Experimental Work.

Some experimental work was conducted by request or desire while others were made as a matter of necessity.

It was found in 1933 that string was by far superior to paper in making lines especially in medium to dense woods. This year at the

request to Mr. Pierce a lime marker was tried out. This device was not received until nearly the end of the season. The crew were marking in very heavy brush, where it was found practically worthless. We believe that in open woods where there are dark barked trees the lime marker would be equal if not superior to any other kind of marker, and especially so when considering the cost.

At the same time we were asked to try out Wyckoff's scheme of a rapid first working by the crew, followed by a single man to "mop up." This was not tried out because of the heavy brush in which the crews were working, and every effort was being made to cover the area before the leaves fell. This will be tried out next spring.

An experiment was begun to determine the effectiveness of a 500-foot protection zone. This was tried at area No. 13, Grantsville Quadrangle, owned by Arthur Bowser. At this area conditions would not justify working the area with a 900-foot protection zone. Probably one-half the area was cultivated fields and Ribes were very heavy in the remainder, which was woods. Blister rust was found on both white pine and Ribes. This area will be reworked next spring; and if the work is continued, the number of cankers appearing on the pine whose origin is 1935 or later will show the effectiveness of a 500-foot zone under these conditions.

The principal developments new in Maryland were concerning eradicating Ribes on rock cliffs and bluffs. These places were almost entirely shale of varying degrees of hardness. It was soon found that the Ninman farm pick and Ribes hook were practically useless. Mr. Boyd Deffinbaugh, while on scout work, conceived the idea of using a two-pound mine pick and of having one end slightly curved and the other end flattened to form a small mattock. This was found to be a very

effective tool for digging in shale and a great aid in climbing over steep ground. After considerable experimenting, it is believed that a group of three men is the most efficient sized unit for this type of ground. They should have the following equipment:

Two of the above described picks.

One bottle of sodium arsenite.

One snake bite first aid kit.

One rope, the length and size varying with the nature of the ground.

Usually fifty feet of one-half-inch rope will be satisfactory. This is not too heavy to carry and yet strong enough for any purpose needed except when a man must hang "dead weight" over a high cliff. In a few instances, it was necessary to use a three-quarters-inch rope, one hundred and twenty-five feet long. After one man narrowly escaped being hit in the eye by a stone which the rope had loosened, we added to the equipment a steel trench hat and an order to "never look up." This type of work is hazardous enough at the best, and no means should be spared to insure all the protection possible for the men.

Frequently bushes were found growing in a rock crevice or some other place which made complete eradication impossible. At the suggestion of Mr. H. C. Buckingham, District Forester, sodium arsenite was used. Complete killing was found in all cases observed. This was prepared and used as follows: A shoe polish bottle or other similar one having a dauber on the cork was filled about two-thirds full of sodium arsenite and the remainder with water, thus making a thin paste. The bush was cut off, and the chemical applied to the cut surface. Care should be taken to prevent this mixture from touching the hands as burning may result and it is a deadly poison.

8. Informational Activities.

The principal means of passing on information to the public were personal interviewing, illustrated lectures, educational displays, and newspapers. The following summary gives the totals for this work:

Meetings addressed	27
Attendance	533
Items published	8
Initial interviews	1287
Publications distributed	2676
Follow up calls	32
Posters placed	18
Educational displays	1

In Garrett and Allegany Counties all the vocational agriculture classes were addressed, also in Hancock, Washington County. One group of farmers in Garrett County and two in Allegany County met in the interest of blister rust control. One boy scout organization in Garrett County and one Forestry club (4-H) in Allegany County met for the same purpose. It was found in interviewing landowners that frequently men would remark that they heard about it at a certain meeting, or read about it in the paper, or perhaps someone who is in high school informed them about it. This was usually of great help. An educational program should always precede the initial interviews to secure cooperation. In a few cases it was found that the owner had destroyed his cultivated bushes as a result of the educational work before he was personally interviewed. Not much reaction was observed to posters and educational displays, but they are undoubtedly of value.

A display booth, six feet by eight feet, was placed at the Cumberland fair, which attracted much attention; however, it was

visited by comparatively few owners of white pine. Many questions were asked which covered nearly every phase of agriculture from the control of bean beetles to large scale lumbering on the west coast. In most cases they were referred to their county agent, district forester, or extension forester. It was estimated that eight hundred and thirty-three persons observed this display, and about an equal number of publications were distributed.

9. Plans for 1935.

At present practically all of the white pine which was located and mapped has either been worked or found not to justify working at the present time in Garrett and Allegany Counties and that part of Washington west of Sideling Hill Mountain. The present plans are to rework all ground in Allegany and Washington Counties where Ribes were found in 1934 and to scout the areas where conditions seem favorable to their growth. Every effort will be made to complete the eradication of cultivated Ribes in the proposed control area in Allegany and Washington Counties. Swallow Falls, Herrington Manor, New Germany State Forests, and the two areas at Bittering will be reworked. This work is to be done about May 1, or when the leaves first appear on the Ribes. Any remaining funds will be used in Washington, Frederick, Baltimore, or Garrett Counties according to the results of the pre-eradication survey to be conducted this winter and the available funds after July 1, 1934.

In the event any other areas are reworked in Garrett County, they will be selected on the basis of (1) the amount and quality of the pine, (2) the number of Ribes present, and (3) the attitude of the owner. It is possible that initial eradication will be done on some land in this county provided more funds become available.

As no detailed pre-eradication survey work has been done east of Sideling Hill, no accurate estimate of the required work can be made. This survey will be made during the winter of 1934 - 1935. The following information has been acquired to date as a result of scouting and location work.

1. Approximately 500 acres of white pine are known to be present in Baltimore County, principally plantations on the Lock Raven Reservation. No wild Ribes are believed to be present in this section. Some cultivated are probably present.

2. Considerable white pine, both planted and natural, is known to be present in the Catoctin Mountains. Wild Ribes are present making from medium to heavy growth at the higher elevations. Blister rust has been found in this section.

3. Conditions in South Mountain are similar to those in the Catoctins except probably more disease is present.

4. White pine is present in varying quantities in that section between Clearspring and Sideling Hill. Very little is known as to the wild Ribes, except that they have been reported as being present.

These sections will be mapped and scouted this winter, and the control work next summer will depend on the results of the survey and available funds.

In addition to the control work on forests and large plantations, some work, principally "mopping up", around numerous growing white pine will be done. This will be a continuation of the previous work by the State Horticultural Department and the U. S. Department of Agriculture Bureau of Plant Quarantine.

Some consideration should be given ornamental planting. This should be in an advisory and supervisory capacity, and then only with the full cooperation of the city, town, or village in which the work is being done. This work is of importance, but should be secondary to the forests and large plantations.

Assuming that adequate funds are available the following should be done by November 1, 1935:

1. Initial and the first re-working on all of Garrett and Allegany Counties, also part of Washington County.
2. Initial eradication on all lands justifying the work in the remainder of Washington County, and Frederick and Baltimore Counties.
3. Complete nursery sanitation wherever applied for.

9. Legislation.

The following proposed regulations have been approved by the State Horticultural board and are being submitted to the State Board of Agriculture.

STATE OF MARYLAND
STATE BOARD OF AGRICULTURE

RULES AND REGULATIONS FOR THE SUPPRESSION OF THE
WHITE PINE BLISTER RUST DISEASE

It has been determined that a very destructive disease of five-leafed pines, known as the white pine blister rust caused by the fungus Cronartium ribicola Fischer, has become established in Maryland. Since this fungus parasite requires an alternate host belonging to the genus Ribes (currants and gooseberries) in order to perpetuate itself and to spread from one white pine tree to another, the State Board of Agriculture, by virtue of the provisions of Chapter 391, of the "Acts of the General Assembly of Maryland of 1916", Article 2A of the Code of Public General Laws, Section 7, does hereby proclaim the following rules and regulations for the suppression of the blister rust disease by the eradication of currant and gooseberry plants in certain, hereinafter described areas, the same to be known as white pine blister rust control areas; and by making it a misdemeanor to introduce Ribes plants into the control areas.

Section I.

The following white pine blister rust control areas are hereby established:

A - All of Garrett County except that part lying east of a line extending along the crest of Big Savage Mountain and in the same general direction to Savage River, thence along Savage River to the Potomac River.

B - In Allegany and Washington Counties all the land included within the following lines: Beginning at the Mason-Dixon Line on the crest of Sideling Hill and running southwest in a direct line to the junction of Sideling Hill Creek and the Potomac River, thence southwestward along the Potomac River to Oldtown, thence north on Bear Hill Road and Pine Ridge to

Belts Road, thence northwest on Belts Road to West Warrior Mountain Road, thence northeast on West Warrior Mountain Road to Williams Road, thence northwest on Williams Road to Rush, thence northeast on Murleys Branch Road to Dickinson Hollow Road, thence northwest on Dickinson Hollow Road to Wilson Road, thence north to Wilson Road to U. S. 40 and Street Road, thence north on Street Road to the Pennsylvania Line, thence due east to the point of beginning. All lines as shown on the U. S. Geological Survey maps and roads as named by the County Commissioners of Allegany County.

C - Fort Frederick State Park and an adjacent zone surrounding the land boundary of said Park one mile wide in which no cultivated black currants (*Ribes nigrum* L.) shall be grown, and in like manner a zone 1500 feet wide in which no *Ribes* (currants or gooseberries) shall be grown or exist.

D - The Loch Raven Reservation owned by the City of Baltimore, and an adjacent zone surrounding the boundary of said reservation one mile wide in which no cultivated black currants (*Ribes nigrum* L.) shall be grown, and in like manner a zone 1500 feet wide in which no *Ribes* (currants or gooseberries) shall be grown or exist.

E - The following nurseries:

1. A Gude and Sons, Nurseries at Rockville and Ashton.
2. Quaint Acres Nursery, Silver Spring.
3. Rock Creek Nursery, Rockville.
4. Rolandhurst Nurseries, Hebron.
5. J. H. Small and Sons' Nurseries, Norbeck.
6. State Forest Nursery, College Park.
7. Towson Nurseries, Inc., Towson and Ashland.

And:

Such other nurseries as are determined by the State Horticultural Department, as having valuable white pine plantings or seedbeds in such

locations that Ribes eradication in the vicinity is practicable and desirable. Surrounding each nursery here named or that may be later selected as a white pine blister rust control area, there shall be also an adjacent zone one mile wide in which no cultivated black currant (Ribes nigrum L.) shall be grown and in like manner, a zone 1500 feet wide in which no Ribes (currants or gooseberries) shall be grown or exist.

Section II.

No person, firm, or corporation shall possess, transport, plant, propagate, sell, or offer for sale, any Ribes (currant or gooseberry) plants, roots, scions, or cuttings of any kind or variety within any white pine blister rust control area, established under these rules and regulations or under any amendment thereof.

Section III.

Within the control areas here listed or that may hereafter be designated, and within the border zones, the agents of the State Horticultural Department are authorized to destroy all Ribes (currant and gooseberry) plants of any kind or variety, both wild and cultivated that in the judgment of the State Pathologist or the State Forester or their agents, are detrimental to the suppression of the white pine blister rust in the State: provided that the owners of cultivated Ribes plants shall have the right of appeal before their plants may be destroyed unless said cultivated varieties have been abandoned for at least three years, in which case such abandoned plants shall be considered the same as wild plants and may be destroyed forthwith.

At least ten days prior to destroying of any cultivated currant or gooseberry plants, the State Horticultural Department shall notify the owner of the bushes, in writing, of its intention. Any owner of cultivated bushes shall have the right of appeal, within five days after receipt of written notice, to the Executive Officer of the State Board of Agriculture and pending

decision as to said appeal, the cultivated bushes shall not be destroyed by the State Horticultural Department or its agents.

Section IV.

The State Horticultural Department is hereby authorized to cooperate with the State Department of Forestry, the Department of Agriculture of the Federal Government, and with counties, municipalities, corporations and individuals in the State, for the prevention or suppression of white pine blister rust and for carrying out investigations on this disease.

Section V.

These rules and regulations shall have the force and effect of law and all violations of them shall be punishable as misdemeanors.

Section VI.

These rules and regulations shall take effect December 1, 1934.

Approved by the State Board of Agriculture

October ____, 1934.

R. A. Pearson, Executive Officer

U. S. DEPARTMENT OF AGRICULTURE
Division of Plant Disease Eradication

STATISTICAL REPORT OF RIBES ERADICATION WORK UNDER E. C. W.

State: MARYLANDYear: 1934

Name of Town Where Camp Located and F.S. Camp Number	Grantsville 5-52	Allegany Co.	Oakland 5-59	Totals for State
No. Towns Worked	1		1	2
Period Work Performed	6/23-8/4		6/22-8/4	6/22-8/4
Ave. No. Enlisted Men Per Day	7		7	14
No. Tech. Foremen and Checkers				0
Total Acreage Worked	180		80	260
Acreage Pine Protected	20		-	20
Ribes Wild	18,399		57,652	76,051
Pulled Cult.	0		0	0
Total Man Hrs. (Enlisted Men)	738	36	978	1,752
Total Acreage Worked				
Acreage Pine Protected				
Ribes Wild				NONE
Pulled Cult.				
Total Man Hrs. (Enlisted Men)				
Total Acreage Worked	180		80	260
Acreage Pine Protected	20			20
Ribes Wild	18,399		57,625	76,051
Pulled Cult.	0		0	0
Total Man Hrs. (Enlisted Men)	738	36*	978	1,752
Cost of Crew Transportation	NONE		NONE	0
Tech. Foremen and Checkers	Total Man Hours			1,752
	Total Gov't			8292.00
	Cost State			
	This work was performed almost entirely by enlisted men.			NONE

* 6 man days (36 hours) of E.C.W. labor was used in Allegany Co. to work with the N.R.A. men in emergencies.

H. E. Yost

October 29, 1934

U. S. DEPARTMENT OF AGRICULTURE
Division of Plant Disease Eradication

STATISTICAL REPORT OF RIBES ERADICATION WORK UNDER M.R.A.

Year: 1934 (Jan. 1-Oct. 15)

State: MARYLAND

Name of District Agent		Totals for	
No. towns worked		State	
Period work performed		Apr. 21-Oct. 15	
No. men employed		42	
Initial and Re-erad.	Total acreage worked	106,435	
	Acreage pine protected	31,380	
	Ribes Wild	851,183	
	Pulled Cult.	1,062	
	Total man hours*	16,875	
	Total cost of Gov't.	\$ 10,450.47	
	Ribes erad. State	0	
	Total acreage worked	469	
	Acreage pine protected	44	
	Ribes Wild	37,886	
	Pulled Cult.	0	
	Total man hours*	422 $\frac{1}{2}$	
	Total cost of Gov't	\$ 204.73	
	Ribes erad. State	0	
Initial and Re-erad.	Total acreage worked	106,904	
	Acreage pine protected	31,424	
	Ribes Wild	889,024	
	Pulled Cult.	1,062	
	Total man hours*	17,297 $\frac{1}{2}$	
	Total cost of Gov't	\$ 10,655.20	
	Ribes erad. State	0	
	Total man hours	2,313.5	
	Total cost	\$ 2,306.19	
	cost State	0	
Supervisors and Checkers	Total man hours		
	Total cost		
	cost State		

*List the total time of laborers, sub-foremen, foremen, and scouts.
Under "Total Cost of Ribes Erad." include all expenditures for wages and expenses.

H. E. Yost
October 29, 1934.

SUPPLEMENT TO ANNUAL REPORT OF BLISTER RUST CONTROL IN MARYLAND
CONCERNING THE PERIOD OF OCTOBER 15 to DECEMBER 31, 1934.

White pine location, scouting and mapping.

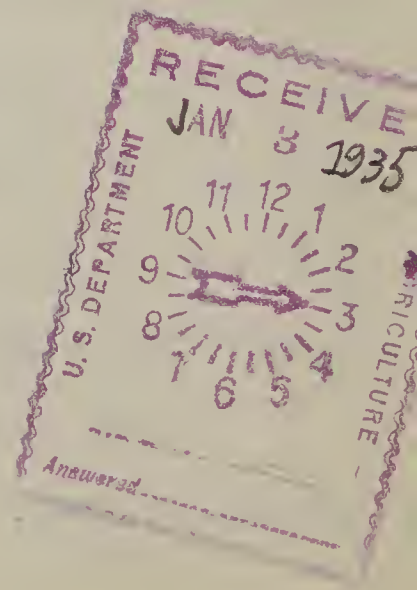
Upon completion of the eradication season and the records, reports, etc., pertaining to it, a preliminary survey was made of the white pine in Washington and Frederick Counties. The results of this survey are as follows:

County	Acres White Pine 5% or more	Acres Scattered White Pine	Remarks
Washington	8400*	10000*	Does not include west of Sideling Hill Mt.
Frederick	2000	10000	

* Result of detailed mapping. Does not include South Mountain. Other figures are preliminary estimates.

This survey was followed up by detailed mapping. This mapping has been completed from Sideling Hill Mountain to Clearspring. White pine in varying amounts is found in practically all of the woodland between Tonoloway Ridge and Sideling Hill Mountain. From Tonoloway Ridge east and including Licking Creek drainage area, much of the more level land is cultivated or planted in orchards, and in the narrow valleys and on the steep hillsides is found a mixture of hardwoods, scrub pine, and white pine, the latter comprising up to eighty per cent of the stand with a probable average of fifteen percent.

Wild ribes (*R. rotundifolium*) were found in two places on Licking Creek. In each case they were on shale bluffs with a



northern exposure. No other wild ribes were found in this section, but it is believed that they may be present on Sideling Hill Mountain, and possibly on Tonoloway Ridge. It is probable that cultivated ribes will be found at about one-half of the homes.

The only educational work was an exhibit at the Flintstone Fair on November 30 and December 1. The fair is conducted by the Flintstone High School and is of a local nature. The exhibit consisted of an educational display, showing specimens of diseased ribes leaves and white pine, also a map of the locality, showing the location of wild ribes and infection centers.

Brief statement of the present status of the work:

Garrett County.

1. All the best white pine was worked first time, and two areas were reworked.
2. Several areas were not worked because it was questionable whether it was justifiable due to extremely heavy ribes growth or lack of interest on the part of the owner.

Allegany County.

1. All the pine worked first time except three isolated areas which seemed questionable whether or not it was justifiable.

Washington County.

1. That part west of Sideling Hill Mountain worked.
2. That part from Sideling Hill Mountain east to Clearspring mapped and not worked.
3. Preliminary survey made of the remainder of the county, showing some white pine and wild ribes in South Mountain.



Frederick County.

1. Sugarloaf Mountain scouted. No ribes found.
2. Preliminary survey made of the Catoctin Mountains and South Mountain. Some white pine and wild ribes found.

Baltimore County.

1. Preliminary survey made of Loch Raven Reservation and Gunpowder River. Large plantations and some natural white pine found. No wild ribes found and none believed to be present.

Summary of Federal expenditures for calendar year, 1934.

Supervision

Pre-eradication survey	\$ 734.47
Eradication work and other	<u>3534.10</u>

Total	\$4268.57
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Miscellaneous, supplies, etc.	81.31
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Labor

NRA	\$6921.95*
CCC	<u>292.00</u>

Total	\$7213.95
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Grand Total	\$11563.83
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Balance available to June 30, 1934	\$ 4508.71
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* Includes 13.50 for labor in July which through error was not paid until November.



State Maryland

Calendar year 1934

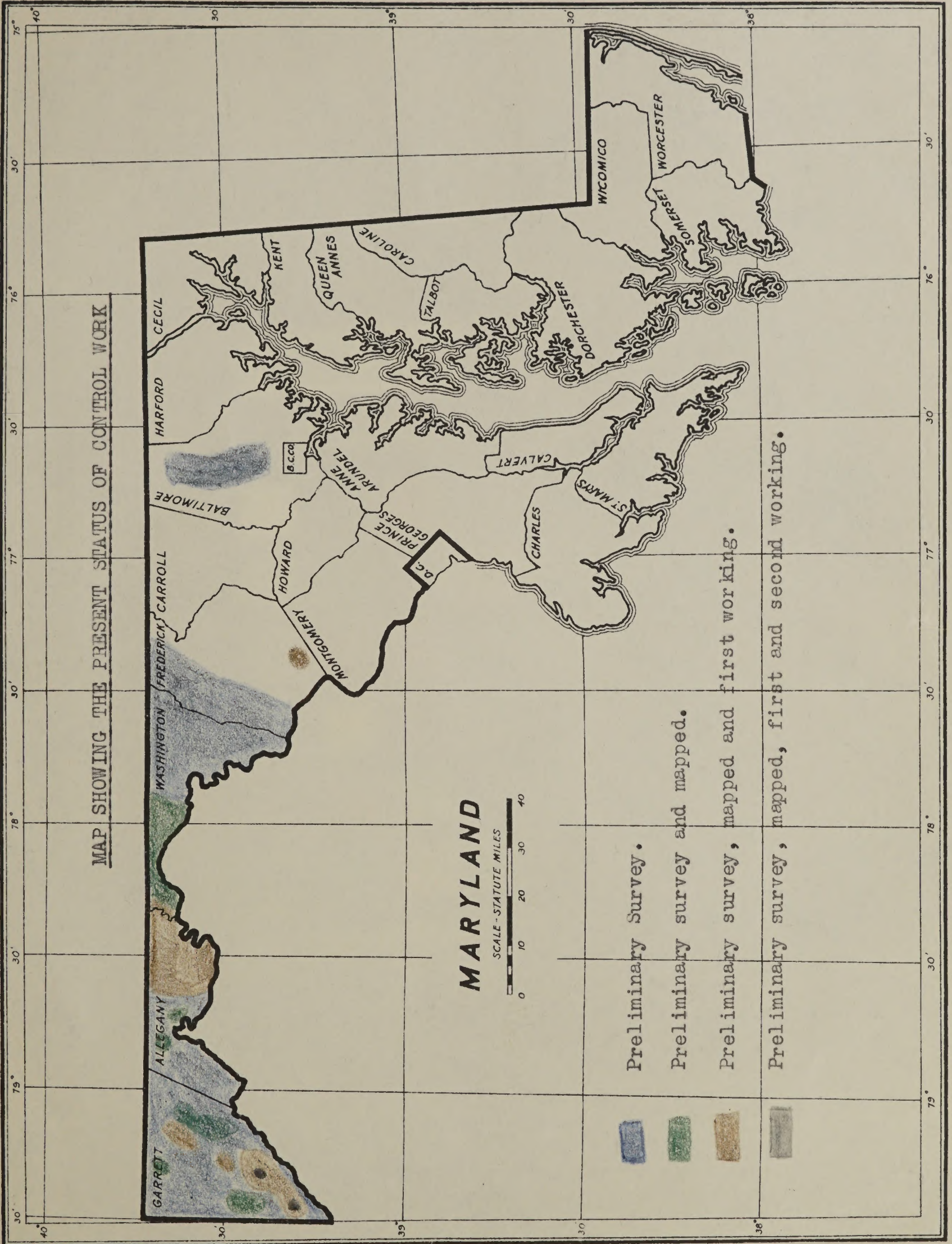
Table I.- Expenditures for General Supervision and District BRC Agent Activities

	Salaries			Total	Expenses			Total Sal. & Exp.
	B.F.I.	N.R.A.	State		R.F.I.	N.R.A.	State	
General supervision								
BCC Agent Act.		2656.92				1493.67		4150.59
Total								

Table II.- Expenditures by Programs for Control Projects Other Than General Supervision and BRC Agent Activities

UNIT A REG. COOP. PROGRAM	Projects	Ribes Eradication				Ribes Compen- sation	Treatment Diseased Fines	Field Data	Totals
		Regular Control Work	Special Control Work Nursery Sanitation	Blk. Currant Eradication	Supervision of Ribes Eradication				
UNIT B ECW PROGRAM	State								
	Wages								2922.00
	Expen- ses								
	Total								
UNIT C NRA PROGRAM	State								
	Wages								7039.93
	Expen- ses								81.31
	Total								7121.24
UNIT D FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT E FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT F FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT G FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT H FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT I FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT J FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT K FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT L FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT M FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT N FEBA PROGRAM	State								
	Wages								
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UNIT O FEBA PROGRAM	State								
	Wages								
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UNIT P FEBA PROGRAM	State								
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UNIT Q FEBA PROGRAM	State								
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UNIT R FEBA PROGRAM	State								
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UNIT S FEBA PROGRAM	State								
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UNIT U FEBA PROGRAM	State								
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UNIT V FEBA PROGRAM	State								
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UNIT W FEBA PROGRAM	State								
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UNIT X FEBA PROGRAM	State								
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UNIT Y FEBA PROGRAM	State								
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UNIT Z FEBA PROGRAM	State								
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UNIT AA FEBA PROGRAM	State								
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UNIT AB FEBA PROGRAM	State								
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UNIT AC FEBA PROGRAM	State								
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UNIT AE FEBA PROGRAM	State								
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UNIT AF FEBA PROGRAM	State								
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UNIT AQ FEBA PROGRAM	State								
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UNIT AY FEBA PROGRAM	State								
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UNIT AZ FEBA PROGRAM	State								
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UNIT BA FEBA PROGRAM	State								
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UNIT BB FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT BC FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT BD FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT BE FEBA PROGRAM	State								
	Wages								
	Expen- ses								
	Total								
UNIT BF FEBA PROGRAM	State								
	Wages								
	Expen- ses								





November 1, 1914

THE NORRIS PETERS CO., WASHINGTON, D. C.

HEY/woh

Total Eradication Columns 10, 13, 20, 27			Total Supv. Except Pre-arad. Survey Columns 19, 24, 31, 34			Misc. Exp. Tools, sup- plies, etc.	Md. Total Jan. 1 - Oct. 15 Columns 10, 17, 24, 31, 39	Av. Ribes per acre	Average Cost per Acre				County
									Based on total cost		Based on Eradication cost		
									W.Pine 47 ÷ 4	Total A. 47 ÷ 7	W.Pine 42 ÷ 4	Total A. 42 ÷ 7	
Hours	Days	Cost	Hours	Days	Cost								
422.5	56	\$204.73	40	5	\$21.13		\$204.73	80.5	\$4.65	\$ 0.43	\$4.65	\$0.43	Garrett Re-eradicated
9861	1311.5	4538.46	2455	272	1630.67		5744.27	178	4.32	1.29	3.41	1.02	Garrett Initial
10283.5	1367.5	4743.19	2495	277	1651.80		5949.00	169	4.33	1.21	3.45	0.96	Garrett Total
6699	887	3059.95	1977.5	216	1193.29		4223.23	.46	0.16	0.044	0.11	0.032	Allegany
315	40	141.20	340	42.5	178.44		255.41	2.7	0.063	0.051	0.035	0.028	Washington
			16	2	10.03	Fitz. 24 37 Misc. 73 31	117.74						Frederick
			16	2	20.06	89 76	109.82						Others
17297.5	2294.5	7944.74	4844.5	539.5	3053.62	187 44	10655.20	8.2	0.339	0.099	0.24	0.075	Total W. E. A.
													Garrett E. C. W.
													Allegany E. C. W.
1752	292	292.00					292.00	292	8.15 *	0.68 *			Total E. C. W.
19049.5	2586.5	\$8236.74	4844.5	539.5	\$3053.62	187 44	\$10947.20	9.2	\$0.348	\$0.102	\$0.261	\$0.076	Maryland Total January 1 - October 15.
40	41	42	43	44	45	46	47	48	49	50	51	52	

HEY / woh

